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MEDICAL ENTOMOLOGY STUDIES - I.

A NEW INTERPRETATION OF THE SUBGENUS *VERRALLINA* OF THE GENUS *AEDES* (DIPTERA: CULICIDAE).

by

John F. Reinert

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MEDICAL ENTOMOLOGY STUDIES - I.

A NEW INTERPRETATION OF THE SUBGENUS *VERRALLINA* OF THE GENUS *AEDES* (DIPTERA: CULICIDAE)[1].

By

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ABSTRACT

The subgenus *Verrallina* Theobald is redescribed and compared to related subgenera of *Aedes* Meigen. A new interpretation of the subgenus is given and is based primarily on the unusual development of the male and female genitalia. *Neomacleaya* Theobald is reduced to a synonym of *Verrallina*. New information on biology, distribution, descriptions and corrections for a number of species is presented. Seven new species, *comosus, harrisonicus, johorensis, pseudovarietas, ramalingami, sabahensis* and *sohni*, are described and illustrated. A number of stages and structures are described and illustrated for the first time. New synonyms in this paper are: *butleri* Theobald (= female only of *seculatus* Menon); *incertus* Edwards (= *dermajoensis* Brug); *carmenti* Edwards (= *ceramensis* Brug); *nobukonis* Yamada (= *ishigakiensis* Bohart); *rarus* Delfinado (= *khmerus* Klein); *uncus* (Theobald) (= *hirsutipleura* Barraud) and *yusafi* Barraud (= *siamensis* Delfinado). *Aedes adustus* Laffoon is resurrected from synonymy. Lectotypes for *carteri* Wijesundara, *ceramensis* Brug, *hirsutipleura* Barraud, *mediofasciatus* Theobald and *petroelephantus* Wijesundara are designated.

INTRODUCTION

There has been considerable confusion as to the proper taxonomic status of *Aedes* Meigen, *Neomacleaya* Theobald and *Verrallina* Theobald and their included species. *Verrallina* was originally described by Theobald (1903: 295) as a genus with 3 included species of which only one, *butleri* Theobald, remains in this taxon, the other 2 species have been transferred to other genera (*nigra* Theobald to *Ficalbia* Theobald; *smithii* Coquillett to *Wyeomyia* Theobald). Theobald later (1907: 238) described a new genus, *Neomacleaya*, for *indica*, a new species. In 1908 Leicester described his new genus, *Aioretomyia*, and

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placed 5 new species in it.

Edwards (1913: 229) synonymized the genera *Aioretomyia, Neomacleaya* and *Verrallina* with the genus *Aedes* Meigen. He later (1917: 221) placed the species included in the above 3 genera and several additional species in the subgenus *Aedes* Meigen of the genus *Aedes*. All subsequent authors followed Edwards' 1917 arrangement of the subgenus *Aedes* until 1962. Some of the more notable articles were Barraud (1928, 1931, 1934), Edwards (1922a, 1922b, 1924, 1932), Dyar and Shannon (1925), Laffoon (1946), King and Hoogstraal (1947), Wijesundara (1951), Knight and Hull (1951, 1953) and Stone, Knight and Starcke (1959).

Belkin (1962: 412) resurrected *Verrallina* as a distinct subgenus of *Aedes* and provisionally included *Neomacleaya* and *Aioretomyia* as synonyms. He stated, and I concur, that the South Pacific species of *Verrallina* had little in common with the type species (*cinereus* Meigen) of the subgenus *Aedes*. Delfinado (1967) resurrected *Neomacleaya* as a subgenus containing primarily Oriental species previously included in *Aedes, Aioretomyia, Neomacleaya* and *Verrallina;* however, she mentioned *Neomacleaya* was closely related to both *Verrallina* and *Aedes sensu stricto*. Huang (1968) followed Belkin's 1962 publication and assigned the species from New Guinea to the subgenus *Verrallina* (including *neomacrodixoa* King and Hoogstraal and *panayensis* Ludlow). Thus in 1968 Delfinado (30 April) and Huang (10 July), in independent work, each determined the species *neomacrodixoa* and *panayensis* as belonging to the subgenus each was working with. This example demonstrates that the 2 subgenera were poorly defined. Klein (1973) followed Delfinado's 1967 and 1968 works in treating the Cambodian species of *Neomacleaya*.

A new interpretation and description of the subgenus *Verrallina* is presented here. The subgenus, by this new concept, is separated into Sections A and B and Section A divided into Series I, II and III. This new definition of the subgenus resulted primarily from a study of the subgenera of the genus *Aedes*. During this study it became apparent that there were a number of inconsistencies, incorrect indentifications and synonymous species in earlier publications dealing with the subgenus *Neomacleaya*. The evolution of the present interpretation of the *Verrallina* resulted from the examination of the types of most of the included species and specimens of all except 2 species. Material of *cunninghami* Taylor and *spermathecus* Wijesundara was not available for examination. All specimens and types in the United States National Museum (USNM) including the Southeast Asia Mosquito Project (SEAMP) and Medical Entomology Project (MEP) collections, many specimens and most types in the British Museum (Natural History) (BMNH) and numerous specimens and types from other museums and individuals were examined by me during this study.

Little new information on species in Series I of Section A can be added here to the presentations given by King and Hoogstraal (1947), Belkin (1962) and Huang (1968). However, considerable new information on synonyms, biology, distribution, previously undescribed stages, corrections to published work and several new species are added to Series II and III of Section A and Section B. Unfortunately the adults of a number of species of these sections and series are very similar in habitus and can not be separated with certainty except by genitalia preparations. Other factors hampering the identification of species are: lack of undamaged and sufficient numbers of specimens (several species are represented by only the type or a very few specimens which are badly rubbed, have vital parts broken off and missing, or represented now only by a genitalia mount, the adult body being lost); original and subsequent descriptions and illustrations of a number of species are not sufficient to separate them from other morphologically similar species; association of sexes of several species is only presumptive and needs confirmation; some species show adult sexual dimorphism; and the immatures of a significant number of species remain to be found. The current taxonomic knowledge of the subgenus *Verrallina* is summarized in Table 1. Many of the taxonomic problems within the *Verrallina* such as species group classification, species synonymy, correct association of sexes and knowledge of immatures can be solved only when progeny rearings become available.

Abbreviations used in references to literature conform to the BIOSIS List of Serials, Biosciences Information Service of Biological Abstracts, Philadelphia, 1972. In the synonymy sections, an asterisk following the abbreviations used (♀ = female, ♂ = male, P = pupa, L = larva) indicates that at least some portion of that sex is figured. The abbreviations used in distribution sections are the same as in the synonymy but with the following additions, p = pupal skin, l = larval skin and E = egg. The number of specimens used in determining range and mode seta branching in pupal and larval descriptions and tables is included in parentheses after the table headings. In pupal descriptions and tables the number of branches on abdominal seta 1-I was measured on the basal third of the seta. A dash (-) on pupal and larval tables indicates the seta was broken off and missing from all specimens examined or the seta showed no mode. Measurements on the illustrations are in millimeters. Distribution records are indicated as follows: countries are in capital letters; provinces and primary administrative divisions are in italics; and place names have the first letter capitalized. The number of specimens examined from each province follows the last place name of the province in the distribution sections. The spelling of provincial and locality names was taken from the following Official Standard Names Gazetteers prepared by the Geographic Names Division, U. S. Army Topographic Command and the Office of Geography, U. S. Department of the Interior: Cambodia (1971), Indonesia (1968), Malaysia (1970), Philippine Islands (vols. I and II, 1953), South Vietnam (1971) and Thailand (1966). Locality names which did not appear in the gazetteers were spelled according to the collection data sheets and labels on the specimens.

Information in the biology and distribution sections was taken from the collection sheets and specimen labels of the specimens that I examined. Much of this information is reported here for the first time.

Nomenclature and chaetotaxy used for females, males, male genitalia, pupae and larvae follow Knight (1970, 1971), Knight and Laffoon (1970a, 1970b, 1971a, 1971b) and Laffoon and Knight (1973). The terminology of the female genitalia follows Reinert (1974).

GENUS *AEDES* MEIGEN

SUBGENUS *VERRALLINA* THEOBALD 1903

Logotype: *Aedes butleri* Theobald

Neomacleaya Theobald 1907, Monogr. Culicidae 4: 238. Haplotype: *Neomacleaya indica* Theobald. NEW SYNONYM.

Aioretomyia Leicester 1908, Culicidae Malaya p. 185. Logotype: *Aioretomyia varietas* Leicester.

The following description of the subgenus is based on specimens of 91 species examined and the published descriptions of the remaining 2 species not seen.

FEMALE. *Head.* Antenna dark brown, 0.91-1.42 length of proboscis, pedicel brown with a few short fine hairs and usually a few small scales mesally, flagellomere 1 with basal area pale and with several small dark scales; clypeus brown, bare; maxillary palpus dark brown scaled, 4 segmented, 0.11-0.21 length of proboscis; proboscis dark brown scaled, 0.84-1.55 length of femur I; eyes contiguous (Section A) or separated in front (Section B and *mccormicki* Belkin); ocular setae dark and well developed; scales on head broad and decumbent except for a few narrow curved pale ones along coronal suture (most species of Series III of Section A) and a few semi-erect forked scales near ocular line in Section B, a few narrow scales on ocular line; occiput with several to numerous erect forked scales, decumbent scales broad and/or narrow. *Thorax.* Scutal integument usually dark; scutum covered with narrow curved dark scales, some species also with narrow curved pale scales forming small patches usually on following areas: median anterior promontory, anterior and lateral scutal fossal, supra-alar and occasionally on margins of prescutelar space; scutellum with a patch of narrow curved scales on each lobe; prescutellar space bare, a few species with a narrow median cephalic stripe of scales; dark setae on the following areas: 2-10 median anterior promontory, numerous anterior acrostichal, several to numerous posterior acrostichal, numerous dorsocentral (anterior and posterior), scutal fossal (3-9 anterior, 2-8 lateral and usually 1-2 posterior), numerous supra-alar, 4-8 posterior medial scutal, 1 postalar callar and scutellar (several long and short ones on both lateral and median lobes); pleural integument brown, usually dark; antepronota widely separated, broad scales present or absent, 7-28 short and long setae; postpronotum with narrow curved scales dorsally (a few species with these scales apparently absent) in Section A, or scales absent in Section B, 3-10 posterior dark setae, some species also with a few short fine hairs; propleuron with a patch of broad white scales, 6-21 setae; prosternum bare except for *adustus* Laffoon, *andamanensis* Edwards, *margarsen* Dyar and Shannon and *sohni* new species, which have a small patch of short fine setae on median dorsal area; paratergite bare except *indicus* which has a few narrow pale scales; subspiracular area and mesomeron bare; postspiracular area with or without scales, 2-12 setae; mesepisternum with an upper and a lower patch of broad scales, 2-7 upper and 6-19 posterior setae, some species also with a few short fine hairs on anterior, dorsal and ventral areas; prealar knob usually without scales, 4-22 setae; mesepimeron with a patch of broad white scales near center, 5-33 setae dorsad of scales patch, Section A with a few (2-3) to numerous fine golden hairs caudad of scale patch, hairs in some species restricted to lower posterior margin of scale patch while others have numerous hairs along entire posterior margin of scale patch and extend to near ventral margin of sclerite; metameron bare, however, short fine hairs and small pale scales are present in *gibbosus* Delfinado and members of the *andamanensis* Group (see discussion of *adustus*). *Legs.* Coxae I-III each with several setae and a patch of pale scales, I also with brown scales; trochanters I-III each with a few short setae and small scales; femora I and II with anterior surfaces brown scaled, II occasionally with a pale scaled ventral stripe, I with posterior surface brown scaled with a pale dorsal longitudinal stripe, II with posterior surface with a pale ventral longitudinal stripe, III with anterior and posterior surfaces pale scaled except for an anterodorsal and posterodorsal longitudinal brown scaled stripe; tibiae I-III brown scaled, I and II occasionally with a longitudinal pale scaled stripe on posterior surfaces; tarsi I-III brown scaled; posttarsi I-III with ungues variable, III with ungues simple in Section A and toothed in Section B. *Wing*. Dorsal and ventral veins with brown scales; alula with scales on margin, scales narrow to moderately broad; upper calypter with several setae on margin; 1-3 remigial setae. *Halter*. Pedicel pale; capitellum covered with pale and/or dark scales. *Abdomen*. Tergal scaling variable, all dark scaled or with pale scaled patches and bands, usually with a laterobasal pale scaled patch, laterotergite of I with a patch of broad pale scales; sternal scaling variable, from completely pale to dark scaled, usually with pale scaled basal bands and apical areas dark scaled; terga and sterna with numerous setae, mostly along posterior margins. *Genitalia*. Tergum VIII moderately pigmented, wide, base usually slightly concave, apex gently rounded or slightly concave, numerous short and moderately long setae scattered over apical 0.28-0.88, basolateral seta present or absent, some species with a small bulla in this location, covered with minute spicules, numerous broad scales covering apical 0.50-0.84, basal 0.1-0.7 retracted into segment VII, VIII-Te index 0.35-0.79, VIII-Te/IX-Te index 1.67-6.82; sternum VIII moderately pigmented, wide, base concave mesally, apex with a shallow to moderately deep median indentation with a small lobe on each side of midline, setae on lobe thin (Section A) or stout (Section B), numerous short and moderately long setae scattered over most of surface, covered with minute spicules, numerous broad scales covering much of apical 0.80-0.96, apical intersegmental fold unpigmented, VIII-S index 0.52-0.80; tergum IX moderately to heavily pigmented, wide, short and usually ribbon-like, setae absent (several setae present in *gibbosus* and *yusafi* Barraud), covered with minute spicules, IX-Te index 0.12-0.49; insula small, unpigmented, with 3-7 small tuberculi (usually each with a minute spicule), or insula absent (Section B) and replaced by median apical portion of lower vaginal sclerite; lower vaginal lip moderately to heavily pigmented, narrow, with or without spicules, with a small caudally projected heavily pigmented median apodeme, lower vaginal sclerite very lightly to heavily pigmented, variable in shape and number, with or without spicules; upper vaginal lip moderately to heavily pigmented, variable in shape and development, may have median posterior area developed into a vertical shield (Section A, Series III) or a horizontal shield (Section B), with or without spicules, upper vaginal sclerite moderately to heavily pigmented, variable in shape and development, very large, often nearly covering roof of vagina; spermathecal eminence heavily pigmented, shallow to deep in depth, simple to complex, with or without spiny excrescences, without (Section A) or with (Section B) a heavily pigmented spine-lined pouch; postgenital lobe short, narrow to moderately broad, apex rounded or with a small to moderately deep median indentation, 5-29 setae on each side of midline, covered with small spicules, dorsal PGL index 0.47-1.29, ventral PGL index 0.70-1.96; peri-anal membrane with minute spicules; cercus triangular in shape, moderately long, broad at base, apex acute, covered with minute spicules, dorsal surface with a number of short and moderately long setae scattered over most of the surface, a few long ones at apex, ventral surface with a number of short and moderately long setae along outer margin becoming more numerous distally, none to several broad scales on dorsal surface, cercus index 1.76-3.86, cercus/dorsal PGL index 2.42-4.63; 3 seminal capsules, 1 large, 1 medium and 1 small in size, heavily pigmented, elliptical or ovoid, with a narrow or broad neck, several small seminal capsule pores near orifice, base of accessory gland duct unpigmented to moderately pigmented.

MALE. Usually similar to female in general habitus but with the following differences. *Head*. Antenna plumose, 0.76-1.27 length of proboscis; maxillary palpus short, 0.09-0.18 length of proboscis; proboscis 1.01-1.56 length of femur I. *Thorax.* Most setal groups usually with fewer setae. *Legs.* Posttarsi variable, III with ungues simple in Section A (except *prioekaensis* Brug which has one of the ungues with a small tooth) and ungues toothed in Section B. *Abdomen.* Terga with lateral setae rather short; tergum VIII wide with a number of long caudally directed setae. *Genitalia.* Tergum IX moderately to heavily pigmented, mesal area narrow, setae absent; gonocoxite short, broad, heavily pigmented, mesal surface membranous with minute spicules, dorsal, lateral and ventral surfaces with short to long setae, many species with dorsoapical and/or ventroapical lobes or projections, some species with spiniforms subapically on sternomesal area, few to numerous scales on lateral and ventral areas; gonostylus short to moderately long, moderately to heavily pigmented, variable in shape but usually with basal portion somewhat expanded and with a few setae, apical portion narrow and curved, gonostylar claw absent; basal mesal lobe variable in development, consists of a plate situated on membranous basal mesal area of gonocoxite and is strongly fused along sternal margin to tergomesal margin of scleritized ventral surface of gonocoxite, plate connected with its mate by a narrow band covered with spicules and located ventrad of apical portion of prosophallus, with several to numerous short to moderately long thin setae, some groups also with lobes, projections or spiniforms; proctiger with paraproct variously developed, many species with paraproct modified into short or long, heavily pigmented, free arms, other species with paraproct developed into broad contiguous heavily pigmented plates, sternobasal area produced into a small lobe which extends ventrad and articulates at a point on the dorsal surface of the parameral apodeme near base of opisthophallus, base of proctiger fused with tergum X, cercal setae absent; tergum X moderately to heavily pigmented, fused with tergum IX; phallosome complex, opisthophallus--consists of a lightly to heavily pigmented tergal transverse bridge between parameral apodemes, located dorsad of phallus and prosophallus and ventrad of proctiger, phallus--consists of a pair of heavily pigmented, narrowly separated, caudally produced arms which are fused together by a narrow band, base extends laterally and fused to basal portion of prosophallus, apex of phallus formed into a tergal penis filament which extends cephalad, prosophallus--consists of a pair of moderately to heavily pigmented arms or plates with bases widely separated, base attached to paramere, located laterad of phallus, paramere--heavily pigmented, short and small (Section A) or very long and moderately broad (Section B), parameral apodeme--moderately to heavily pigmented, short to long, outer surface broadly attached to tergobasal apodeme of gonocoxite; sternum IX heavily pigmented throughout, large, broad, several short setae in a patch near median caudal area, most species of Section B and several species of Series III of Section A also with a few broad scales.

PUPA. Chaetotaxy and other features are summarized as follows. *Cephalothorax.* Setae 1-3-CT approximately equally developed; 1-CT single to 5 branched; 2-CT single to 4 branched; 3, 6-CT single to triple; 4-CT single to 9 branched; 5-CT double to 12 branched; 7-CT double to 9 branched; 8-CT double to 11 branched; 9-CT single to 6 branched. *Metanotal plate.* Seta 10-CT double to 13 branched; 11-CT single; 12-CT double to 8 branched. *Respiratory trumpet.* Moderately to heavily pigmented; hair-like spicules on inner surface of meatus; index 3.00-5.67. *Abdomen.* Setae 0-II, VII-VIII single; 0-III-VI single or double; 1-I dendritic, well developed with 10-38 branches on basal third; 1-II triple to 37 branched; 1-III double to 14 branched; 1-IV-V single to 10 branched; 1-VI double to 8 branched; 1-VII single to 6 branched; 2-II-VII stout in many species; 2-I single or double; 2-II-VII single; 3-I double to 8 branched; 3-II single or double; 3-III single; 3-IV double to 10 branched; 3-V single to 7 branched; 3-VI single to 6 branched; 3-VII double to 9 branched; 4-I triple to 12 branched; 4-II double to 11 branched; 4-III single to 8 branched; 4-IV double to 5 branched; 4-V triple to 11 branched; 4-VI double to 12 branched; 4-VII double to 7 branched; 4-VIII single to 5 branched; 5-I-III double to 9 branched; 5-IV-V single to triple; 5-VI single to 4 branched; 5-VII single to 6 branched; 6-I single to triple; 6-II single or double; 6-III-V single to 10 branched; 6-VI single to 4 branched; 6-VII double to 8 branched; 7-I, IV single to 6 branched; 7-II single to 7 branched; 7-III single to 6 branched; 7-V single to 11 branched; 7-VI-VII single to triple; 8-III, VII single to 6 branched; 8-IV single to 5 branched; 8-V single to 7 branched; 8-VI double to 5 branched; 9-I single to triple; 9-II-VI single; 9-VII single to 4 branched, weakly developed; 9-VIII single to 6 branched; 10-III single to 10 branched; 10-IV single to 7 branched; 10-V, VII single to 4 branched; 10-VI single or double; 11-III single or double; 11-IV single; 11-VI single or double; 11-VII single to 4 branched; 14-III-VI single; 14-VII-VIII single or double. *Paddle*. Ovoid; minute serrations on basal area of outer margin; minute spicules on apical portions of outer and inner margins; midrib lightly to moderately pigmented and nearly reaches or reaches apex; 1-P usually single, occasionally double; index 1.14-1.70.

LARVA. Chaetotaxy and other features summarized as follows. *Head*. Moderately pigmented; setae 0, 1, 3, 18-C single; 4-C double to 10 branched; 5-C single to 9 branched; 6-C single to 7 branched; 7-C double to 15 branched; 8, 13-C single to 6 branched; 9-C double to 9 branched; 10, 11-C double to 8 branched; 12-C single to 10 branched; 14-C single or double; 15-C with 4-11 branches; 6-MP single or double; 1-C well developed, long and thickened; 4-C small and weakly developed; 5-7-C long, well developed and barbed; 4-C slightly cephalad of 6-C and mesad of 5, 6-C; 6-C laterad and well cephalad of 5-C; 7-C cephalad and well laterad of 6-C; dorsomentum heavily pigmented, with 17-45 teeth; mouth brush with mesal hairs pectinate apically. *Antenna*. Short to moderately long, usually moderately pigmented, scattered spicules over most of shaft, usually more numerous on basal area and longer on outer area near middle; seta 1-A short to long, attached near middle of shaft, and branches more or less flattened; 2-A long, with a subapical constriction; 3-A short, 0.20-0.36 length of 2-A; 4-A moderately long, 0.37-0.74 length of 2-A; 5-A with basal portion flattened, pigmented and with a dorsal spine (see Fig. 52), apical portion unpigmented; 6-A peg-like, short, 0.22-0.39 length of 2-A. *Thorax*. Seta 0-P with 4-23 branches; 1, 7, 14-P single to triple; 2, 3-P single to 5 branched; 4-P single to 9 branched; 5, 6-P single; 8, 10, 12-P single or double; 9-P single to 7 branched; 1-M double to 8 branched; 2-M double to 7 branched; 3-M single to 4 branched; 4-M triple to 13 branched; 5-M single or double; 6-M triple to 9 branched; 7, 10, 12-M single; 8-M with 4-11 branches; 9-M with 6-12 branches; 11-M single to triple; 13-M with 7-40 branches; 14-M with 4-20 branches; 1-T single to 7 branched; 2, 7-T with 4-10 branches; 3-T with 4-21 branches; 4-T double to 11 branched; 5-T single or double; 6-T single to 6 branched; 8-T with 7-27 branches; 9-T double to 4 branched; 10-T single; 11-T single to 4 branched; 12-T single to triple; 13-T with 6-23 branches. *Abdomen*. Setae 0-II-VIII single; 1-I single to triple; 1-II single to 5 branched; 1-III, VII double to 13 branched; 1-IV triple to 15 branched; 1-V triple to 13 branched; 1-VI double to 11 branched; 1-VIII double to 10 branched; 2-I-VII single; 2-VIII double to 5 branched; 3-I with 4-13 branches; 3-II triple to 16 branched; 3-III double to 13 branched; 3-IV triple to 12 branched; 3-V double to 8 branched; 3-VI double to 10 branched; 3-VII double to 12 branched; 3-VIII with 4-11 branches; 4-I with 7-27 branches; 4-II with 4-18 branches; 4-III double to 6 branched; 4-IV double to 5 branched;

4-V with 4-15 branches; 4-VI double to 11 branched; 4-VII double to 7 branched; 4-VIII single to 4 branched; 5-I double to 9 branched; 5-II double to 7 branched; 5-III single to 6 branched; 5-IV single to 4 branched; 5-V single to 5 branched; 5-VI single to 7 branched; 5-VII double to 10 branched; 5-VIII with 5-15 branches; 6-I single to triple; 6-II single to 6 branched; 6-III-IV single; 6-V, VI single or double; 6-VII with 5-18 branches; 7-I single or double; 7-II double to 12 branched; 7-III with 5-15 branches; 7-IV double to 17 branched; 7-V with 4-17 branches; 7-VI double to 13 branched; 7-VII single to 6 branched; 8-II double to 4 branched; 8-III single; 8-IV, V, single or double; 8-VI double to 9 branched; 8-VII triple to 14 branched; 9-I double to 7 branched; 9-II single to 4 branched; 9-III, VI single or double; 9-IV, V, single; 9-VII single to 5 branched; 10-I double to 8 branched; 10-II, VI single to 4 branched; 10-III, IV, VII single to 6 branched; 10-V single to triple; 11-I, III-V, VII single to 5 branched; 11-II double to 6 branched; 11-VI double to 5 branched; 12-II, VI single to 6 branched; 12-III, IV double to 5 branched; 12-V single to 4 branched; 12-VII single to 10 branched; 13-I single to triple; 13-II with 4-24 branches; 13-III triple to 11 branched; 13-IV double to 11 branched; 13-V double to 13 branched; 13-VI with 9-62 branches; 13-VII with 4-18 branches; 14-II, IV, V, VIII single; 14-III, VI single or double; 14-VII single to triple; VIII with comb composed of 7-17 scales arranged in a more or less curved irregular row (*cuccioi* Belkin with scales in 2 rows, one row very short), scales long with a stout median apical spine and small denticles on laterobasal areas or moderately long with uniformly developed denticles on lateral and apical areas; 1-X moderately long, single to triple, attached near middle of posterior area of saddle; 2-X moderately long (long in *cuccioi*), single to 11 branched (usually multiple branched); 3-X very long, single; ventral brush usually with 10 setae on grid and 2 precratal shorter ones, all multiple branched, however, *yusafi* has 8 setae on grid and 1-2 precratal ones, *indicus* and *nigrotarsus* (Ludlow) have 12-14 setae on grid and 2-3 precratal ones and *latipennis* Delfinado has 15-18 setae on grid and 3-4 precratal ones; saddle moderately pigmented, incompletely rings segment X, acus absent; 4 anal papillae, usually moderately long (short in *butleri* and very long in *cuccioi*, *hamistylus* Laffoon and *robertsi* Laffoon). *Siphon.* Moderately pigmented, moderately long, index 1.58-5.00, acus well developed; pecten on basal 0.49-0.65 (on basal 0.67-0.83 in *cuccioi*, *hamistylus*, *robertsi*, *similis* (Theobald) and *trispinatus* King and Hoogstraal), composed of 6-17 teeth (*johnsoni* Laffoon with 14-20 teeth but when 17 or more present the basal 2-3 are much reduced), apical 1-5 teeth longer and wider spaced than remainder of teeth, each tooth long, slender and with 1-3 small stout ventral denticles near base, distal 1-4 teeth occasionally without denticles; seta 1-S short, double to 10 branched, base attached on basal 0.63-0.83 of siphon distad of last pecten tooth (attached within pecten in *cuccioi*, *similis* and *trispinatus*); 2, 6, 7, 9-S single; 8-S single to 8 branched, usually multiple.

EGG. The eggs of only 6 species of *Verrallina* are known including those of *dux* which are described here for the first time. Huang (1968) illustrated and gave measurements for 4 species of the subgenus--*carmenti* Edwards, *funereus* (Theobald), *lineatus* (Taylor) and *parasimilis* King and Hoogstraal. Egg measurements (in microns) of these 5 species are: *dux* 637-730 by 154-179; *lineatus* 756 by 206; *funereus* 806 by 268; *carmenti* 845 by 140 and *parasimilis* 1040 by 200. Moriya et al. (1973) published a description and scanning electron microphotograph of the egg of *nobukonis* Yamada but did not give the egg measurements.

TAXONOMIC DISCUSSION. The subgenus *Verrallina* is characterized and separated from the other subgenera of *Aedes* by the following: in the adults by the combination of (1) head with decumbent scales of vertex all broad or with only a double row of narrow curved scales on coronal suture, (2) antennal pedicel with several short fine hairs and usually a few small broad scales mesally, (3) dorsocentral (anterior and posterior) and acrostichal (anterior and posterior) setae numerous, species in Section B usually with only a few posterior acrostichals, (4) scutum and scutellum with only narrow curved scales, (5) remigial setae present, (6) subspiracular area and paratergite bare (*indicus* with a few pale scales on paratergite), (7) mesepimeron without anterior lower setae, however, all species except the 12 species of Section B, have a few to numerous fine hairs caudad of scale patch, (8) propleuron with 4-21 setae and (9) male maxillary palpus short (0.09-0.18 length of proboscis); in the female genitalia by the combination of (1) heavily pigmented spermathecal eminence, (2) presence of lower vaginal sclerite and (3) presence of 3 heavily pigmented seminal capsules, each of a different size; in the male genitalia by the combination of (1) complex development of phallosome which consists of several component parts (see below), (2) gonostylus without gonostylar claw, (3) sternum IX heavily pigmented throughout, (4) tergum IX without setae and (5) development of proctiger; in the pupae by the combination of (1) setae 1-3-CT approximately equally developed, (2) 6, 9-VII both weakly developed, (3) 9-VIII single to 6 branched, (4) 1-P single, occasionally double and (5) paddle without fringe of hair-like spicules; and in the larvae by the combination of (1) arrangement and development of head setae 4-7-C, (2) antenna with spicules and seta 2-A with a subapical constriction, (3) pecten with 6-20 (usually 12-16) teeth, apical 1-5 teeth wider spaced than remainder, (4) acus present on siphon, absent on saddle and (5) ventral brush usually with 10 setae on grid and 2 precratal shorter ones, all multiple branched.

All stages of the species of *Verrallina* can be separated to either Section A or B but only the female and male genitalia can be readily divided into series. Species in Series II of Section A appear to occupy an intermediate position between those in Series I and III and possess morphological features of the other 2 series. Much additional work is needed in establishing species group categories and the investigation of species complexes. In order to solve these problems, considerable additional specimen collections of individual and progeny reared adults, with their associated immature skins, are required.

Adults of the subgenus *Verrallina* are similar in habitus to those of the subgenus *Aedes* especially *cinereus*, however, they differ significantly in the development of both the male and female genitalia. Species of the subgenus *Aedes* differ from the adults of the subgenus *Verrallina* by the combination of the following: antepronotum and paratergite with narrow scales (only *indicus* of *Verrallina* bears scales on the paratergite); vertex of head with a broad median area covered with narrow curved scales; male with a greater number of setae in antennal whorls; abdominal terga of male with numerous long curved setae on lateral margins; and mesepimeron without fine hairs caudad or ventrad of the scale patch.

The short maxillary palpus of the male is similar to those of the following subgenera of *Aedes*: *Aedes* Meigen, *Bothaella* Reinert, *Cancraedes* Edwards, *Christophersiomyia* Barraud, *Geoskusea* Edwards, *Huaedes* Huang, *Leptosomatomyia* Theobald, *Nothoskusea* Dumbleton, *Paraedes* Edwards and *Rhinoskusea* Edwards. Both males and females of *Verrallina* can be separated from those of the other subgenera of *Aedes* by a combination of the above mentioned characters.

Barraud (1928) first recognized the importance of the female genitalia of this taxon in separating the included species. The female genitalia of *Verrallina* are very distinctive from all other subgenera of *Aedes* by the above features. Other characters that are unusual and can be used to separate species of *Verrallina* from many other *Aedes* are tergum IX wide, usually ribbon-like, usually without setae except *gibbosus* and *yusafi* (some species, such as *clavatus* Barraud, *quadrifolium* Brug and *vallistris* Barraud occasionally with a single short seta on one side); tergum VIII usually very wide; cerci triangular in shape; insula small, unpigmented with 3-7 tuberculi, each usually with a minute spicule, or insula absent (Section B) and replaced by median apical portion of lower vaginal sclerite; and upper vaginal sclerite very large and in many species covering most of vaginal roof. Each currently recognized species of *Verrallina* except members of Section A, Series I, which have very uniform genitalia, possesses distinguishing features of the female genitalia which separates it from other species of the subgenus. However, it was found during this study that the shape of tergum IX was useful in separating a number of species in Series I. Noticeable similarities of the female genitalia were also observed between members of related species within species groups.

The male genitalia of *Verrallina* are very distinct from the other subgenera of *Aedes* especially in the complex development of the phallosome which is divided into the following components: opisthophallus, phallus (with its tergal penis filament), prosophallus, paramere and parameral apodeme. Several of the structure are fused at the joints and have no definite sutures (Reinert 1973b). The complex arrangement and partial fusion of the integral parts of the phallosome of *Verrallina* appear to be similar to forms found in the dixine genera *Nothodixa* Edwards and *Paradixa* Tonnoir (these 2 genera discussed and described by Belkin 1968). Other structures and developments of the genitalia of this subgenus which distinguish many of the species from a number of subgenera of *Aedes* follows: tergum IX without setae; proctiger with paraprocts highly modified into short or long free arms or broad contiguous plates, cercal setae absent; basal mesal lobe modified into a setose lobe which is strongly fused along sternal margin with tergomesal margin of the ventral surface of gonocoxite, many species (Section A, Series II and III and Section B) with stout spiniforms and/or projections; sternum IX heavily pigmented throughout, most species of Section B and several species of Series III of Section A with broad scales; gonostylus without a gonostylar claw; and gonocoxite with dorsoapical and/or ventroapical lobes or projections. The male genitalia of each species are very distinct; however, the genitalia of species in Series I of Section A appear to have undergone less differentiation and are more uniform than the other series and section.

Pupae of *Verrallina* are very similar in chaetotaxy and most species are difficult to separate from each other.

The placement and development of setae in the larvae of *Verrallina* are fairly uniform within species groups; however, most species possess distinguishing features in this stage. A number of species have characters (as pointed out in the subgeneric and species descriptions) that easily separate them from other species within the subgenus. Larvae of *Verrallina* are similar to those of *Aedimorphus* Theobald but can be separated from them by the positions of head setae 4-6-C and the position of the pecten as given by Reinert (1973a: 11). The subapical constriction of antennal seta 2-A is consistant for all members of the subgenus *Verrallina*; however, a number of species of subgenera *Aedimorphus*, *Edwardsaedes* Belkin, *Finlaya* Theobald, *Neomelaniconion* Newstead and *Ochlerotatus* Lynch Arribalzaga also possess this feature. The occurrence of precratal setae of the ventral brush is also shared by the species in the other subgenera (i.e., *Aedes*, *Aedimorphus*, *Edwardsaedes*, *Mucidus* Theobald, *Neomelaniconion* and *Ochlerotatus*) which inhabit temporary ground pools.

DISTRIBUTION. The subgenus *Verrallina* occupies a distribution primarily in the Oriental Zoogeographical Region but with a short extention north to Kyushu, Japan and east into the Carolines, New Guinea and South Pacific Islands and south into northeastern Australia. The ranges of the sections and series of the subgenus are outlined on the map in Figure 1.

MEDICAL IMPORTANCE. Very little has been reported concerning the investigation of *Verrallina* species for pathogens even though a number of species have been recorded feeding on man and other animals. The inability to separate the adults of many species by habitus characters may partially account for the few published accounts of attempts to isolate pathogens from members of this subgenus.

BIOLOGY. The immature stages, for species which have the biology known, prefer temporary, unmoving water in shaded pools located in forested areas. Some species, notably *butleri*, prefer brackish water in coastal mangrove swamps.

Females of a number of species readily bite man and domestic animals usually during the daytime and in shaded forested areas. Some species are serious pests. Adults of many species have been collected in light traps.

The bionomics of *Verrallina* species have been summarized by Steffan (1966), Delfinado (1967, 1968), Huang (1968) and Klein (1973). A large number of species, however, have the bionomics of the immatures and/or the adults unknown or only imperfectly known.

KEYS TO SECTIONS AND SERIES OF *VERRALLINA*

ADULTS[1]

Mesepimeron with a few to numerous fine hairs caudad of scale patch; posttarsi III with ungues simple[2], eyes contiguous in front[3]. . . . . Section A
Mesepimeron without hairs caudad of scale patch; posttarsi III with ungues toothed; eyes separated in front. . . . . Section B

FEMALE GENITALIA

1. Spermathecal eminence with a cephalad produced pouch; insula absent but replaced by "U" shaped median apical projection of lower vaginal sclerite, without tuberculi. . . . . Section B
   Spermathecal eminence without a pouch; insula small, unpigmented and with a few tuberculi (Section A). 2

2. Upper vaginal lip with median posterior area produced into a large vertical shield caudad of spermathecal eminence; spermathecal eminence deep,

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[1] Adults are easily separated to section but show no consistant differences between series of Section A.

[2] See footnote number 2 on page 13.

[3] See footnote number 3 on page 13.

complex and always with numerous well developed spiny excrescences. Series III (*indicus* Series)

Upper vaginal lip without a shield; spermathecal eminence shallow, simple, without spiny excrescences (except some members of Series II). . . 3

3. Lower vaginal sclerites moderately pigmented, with spicules. Series II (*butleri* Series)

   Lower vaginal sclerites very lightly pigmented, without spicules. Series I (*carmenti* Series)

MALE GENITALIA

1. Prosophallus long, phallus short and 0.5 or less length of prosophallus; paramere very long. . . . . Section B

   Prosophallus and phallus approximately equal in length; paramere short (Section A). 2

2. Gonocoxite without dorsoapical or ventroapical lobes or projections, with one or more subapical spiniforms on sternomesal area. Series I (*carmenti* Series)

   Gonocoxite with dorsoapical and/or ventroapical or subapical lobes or projections, subapical spiniforms absent[1]. 3

3. Prosophallus with apical 0.4-0.5 produced into several lightly pigmented, leaf-like structures or a single short broad plate; gonostylus attached at apex of gonocoxite. . . . . Series II (*butleri* Series)

   Prosophallus a moderately long to long, heavily pigmented, narrow arm; gonostylus attached subapically on gonocoxite. Series III (*indicus* Series)

PUPA

Respiratory trumpet with basal 0.4 somewhat expanded; ocular plate with well developed cuticular facets. . . . . Section B

Respiratory trumpet with basal 0.4 usually not expanded, uniform width throughout or with apical area expanded, ocular plate with or without a small area of poorly to moderately developed cuticular facets. . Section A

FOURTH STAGE LARVA

1. Antennal seta 1-A single or double[2]; head seta 7-C double to 4 branched[2]. Section B

   Antennal seta 1-A triple to 9 branched; head seta 7-C with 5-15 branches (Section A). 2

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[1] See footnote number 3 on page 14.

[2] See footnote number 1 on page 16.

2. Comb scales with uniformly developed denticles on lateral and apical areas. . . . . Series I (*carmenti* Series)
Comb scales with a stout median apical spine[1] and with small denticles on laterobasal areas. . . . Series II and III (*butleri* and *indicus* Series)

DESCRIPTION OF SECTION A AND SERIES I, II AND III

SECTION A: *Adults*. Posttarsi III with ungues simple[2]; eyes contiguous in front[3]; vertex without erect or semi-erect scales, occiput with erect scales; mesepimeron with a few to numerous fine hairs caudad of scale patch; postpronotum with narrow curved scales on upper area[4]; antepronotum without scales except for a very few species.

Female genitalia. Insula small, unpigmented, with 3-7 small tuberculi; sternum VIII with numerous thin setae on pair of median apical lobes; upper vaginal lip with or without median posterior area produced into a vertical shield caudad of spermathecal eminence; lower vaginal sclerite very lightly to heavily pigmented, shape and number of plates variable but always positioned on floor of vagina and not attached to lower vaginal lip, with or without spicules; spermathecal eminence shallow to deep, simple to complex, with or without spiny excrescences, without a pouch.

Male genitalia. Phallosome with prosophallus and phallus approximately equal in length, paramere short, parameral apodeme short to moderately long.

Pupa. Respiratory trumpet usually with basal area not expanded, but expanded apically or with uniform width throughout; ocular plate with or without area of poorly to moderately developed cuticular facets.

Larva. Antennal seta 1-A triple to 9 (usually 4-6) branched; head seta 7-C with 5-15 (usually 7-14) branches; thoracic seta 4-P triple to 6 (usually 4-6) branched.

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[1] See footnote number 2 on page 15.

[2] Male of *prioekanensis* with a small tooth on one ungue.

[3] Eyes of *mccormicki* separated in front.

[4] A few species of Series I did not have scales on the postpronotum but these may have been rubbed off in the specimens examined.

Series I. *Female genitalia.* Upper vaginal lip with median posterior area narrow and not produced into a shield; lower vaginal sclerite with a pair of very lightly pigmented plates connected by a small apical band, without spicules, all species with uniform shape; spermathecal eminence shallow, simple, composed of a pair of comma-shaped plates, without spiny excrescences.

Male genitalia. Gonocoxite without dorsoapical or ventroapical lobes or fleshy projections, with one or more subapical spiniforms on sternomesal area; basal mesal lobe consists of a small broad plate with a number of short to moderately long thin setae; prosophallus with apical 0.5-0.6 produced into several lightly pigmented flattened contiguous leaf-like structures; gonostylus attached to apex of gonocoxite (*quadrispinatus* King and Hoogstraal and *variabilis* Huang attached slightly subapically).

Pupa. Respiratory trumpet with a more or less uniform width throughout (a few species with apical portion expanded); bases of setae 2-IV-VI (in most species) more cephalad than bases of setae 4-IV-VI; seta 9-VIII usually triple to 6 branched.

Larva. Comb scales with uniformly developed denticles on lateral and apical areas; seta 2-X usually single to triple[1], usually with one branch longer than others[2].

Series II. *Female genitalia.* Upper vaginal lip with median posterior area moderately broad and not developed into a vertical shield; lower vaginal sclerite with a pair of lightly to moderately pigmented plates, usually ovoid, with spicules; spermathecal eminence shallow, simple, with or without poorly developed small spiny excrescences.

Male genitalia. Gonocoxite occasionally without but usually with dorsoapical or ventroapical lobes or fleshy projections, without subapical spiniforms[3] on sternomesal area; basal mesal lobe consists of a small plate with several short to moderately long thin setae and one or more stout spiniforms or lobes; prosophallus with apical 0.4-0.5 produced into several lightly pigmented flattened contiguous leaf-like structures or a single short broad plate; gonostylus attached to apex of gonocoxite.

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[1] Seta 2-X triple to 4 branched in *sentanius* King and Hoogstraal, 6-7 branched in *lineatus* and 8 branched in *variabilis*.

[2] Branches of seta 2-X approximately equal in length in *foliformis* King and Hoogstraal, *lineatus* and *variabilis*.

[3] *Aedes butleri* and *incertus* Edwards with spiniforms but also with apical projections.

Pupa. Respiratory trumpet as for Series I; bases of setae 2, 4-IV-VI as for Series I; seta 9-VIII usually single[1].

Larva. Comb scales with a stout median apical spine[2] and with smaller denticles on laterobasal areas; seta 2-X with 4-11 (usually 6 or more) branches which are approximately equal in length.

Series III. *Female genitalia*. Upper vaginal lip with median posterior area developed into a large vertical shield caudad of spermathecal eminence; lower vaginal sclerite heavily pigmented, shape and number of plates variable, usually with spicules; spermathecal eminence deep, complex, with numerous well developed spiny excrescences.

Male genitalia. Gonocoxite with one or more well developed dorsoapical and/or ventroapical lobes or fleshy projections, without subapical spiniforms on sternomesal area; basal mesal lobe consists of a large plate with several to numerous short to moderately long thin setae and with 2 or more stout spiniforms and/or one or more large lobes or projections; prosophallus consists of a moderately long to long narrow heavily pigmented arm; gonostylus attached subapically to gonocoxite.

Pupa. Respiratory trumpet with apical portion expanded; bases of setae 2-IV-VI (in most species) more caudad than bases of setae 4-IV-VI; seta 9-VIII usually single or double.

Larva. As for Series II.

DESCRIPTION OF SECTION B

SECTION B: *Adults*. Posttarsi III with ungues toothed; eyes separated in front; vertex with a few semi-erect scales, occiput with erect scales; mesepimeron without hairs caudad or below scale patch; postpronotum without scales; antepronotum with broad scales.

Female genitalia. Insula absent but replaced by a "U" shaped median apical projection of lower vaginal sclerite, without tuberculi; sternum VIII with numerous very stout setae on pair of median apical lobes; upper vaginal lip with median posterior area produced into a large horizontal shield extending over or around spermathecal eminence; lower vaginal sclerite heavily pigmented, formed into a pair of ribbon-like plates around floor of vagina, attached to lower vaginal lip throughout length, fused at apex and developed into a median, "U" shaped projection, plates without spicules; spermathecal eminence shallow, simple, without spiny excrescences, with a heavily pigmented cephalad spine-lined pouch.

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[1] *Aedes lugubris* Barraud with seta 9-VIII triple to 6 branched.

[2] *Aedes butleri* with 1-2 slightly longer and stouter median apical denticles.

Male genitalia. Phallosome with prosophallus very long, phallus short and 0.5 or less length of prosophallus, paramere very long, parameral apodeme very long.

Pupa. Respiratory trumpet with basal 0.4 somewhat expanded; ocular plate with an area of well developed cuticular facets; bases of setae 2-IV-VI more cephalad than bases of setae 4-IV-VI.

Larva[1]. Antennal seta 1-A single or double; head seta 7-C double to 4 branched; thoracic seta 4-P single to triple.

LIST OF SPECIES IN SECTIONS AND SERIES

SECTION A

SERIES I (*carmenti* Series)

1. *azureosquamatus* Bonne-Wepster**
2. *bifoliatus* King and Hoogstraal**
3. *carmenti* Edwards**
4. *cuccioi* Belkin**
5. *embiensis* Huang**
6. *foliformis* King and Hoogstraal**
7. *funereus* (Theobald)*
8. *killertonis* Huang***
9. *leilae* King and Hoogstraal**
10. *lineatus* (Taylor)*
11. *mccormicki* Belkin**
12. *milnensis* King and Hoogstraal**
13. *multifolium* King and Hoogstraal**
14. *obsoletus* Huang***
15. *parasimilis* King and Hoogstraal**
16. *pipkini* Bohart**
17. *quadrifolium* Brug*
18. *quadrispinatus* King and Hoogstraal**
19. *reesi* King and Hoogstraal**
20. *sentanius* King and Hoogstraal**
21. *similis* (Theobald)*
22. *simplus* King and Hoogstraal**
23. *trispinatus* King and Hoogstraal**
24. *vanapus* Huang***
25. *variabilis* Huang***

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[1] *Aedes consonensis* Reinert is somewhat aberrant for Section B in that one larva has seta 1-A triple on one side, 7-C with 7 branches on one side and 4-P with 4 branches on one side.

* = Specimens of this species examined.

** = Holotype or lectotype examined.

*** = Paratype examined.

(?) = Assignment to series uncertain.

SERIES II (*butleri* Series)

1. *butleri* Theobald**
2. *cunninghami* Taylor (?)
3. *dux* Dyar and Shannon**
4. *incertus* Edwards**
5. *iriomotensis* Tanaka and Mizusawa***
6. *lugubris* Barraud*
7. *panayensis* Ludlow**
8. *prioekanensis* Brug**
9. *pseudodiurnus* (Theobald)*
10. *rarus* Delfinado**

SERIES III (*indicus* Series)

1. *adustus* Laffoon**
2. *agrestis* Barraud**
3. *andamanensis* Edwards**
4. *atriisimilis* Tanaka and Mizusawa***
5. *atrius* Barraud*
6. *campylostylus* Laffoon**
7. *cautus* Barraud**
8. *clavatus* Barraud*
9. *comatus* Barraud**
10. *comosus* Reinert**
11. *cretatus* Delfinado**
12. *cyrtolabis* Edwards*
13. *gibbosus* Delfinado**
14. *harrisonicus* Reinert**
15. *hispidus* Delfinado**
16. *indicus* (Theobald)**
17. *johnsoni* Laffoon**
18. *johorensis* Reinert**
19. *kompongus* Klein**
20. *lankaensis* Stone and Knight**
21. *latipennis* Delfinado**
22. *leicesteri* Edwards**
23. *macrodixoa* Dyar and Shannon**
24. *margarsen* Dyar and Shannon**
25. *neomacrodixoa* King and Hoogstraal**
26. *nigrotarsis* (Ludlow)**
27. *notabilis* Delfinado**
28. *nubicolus* Laffoon**
29. *petroelephantus* Wijesundara**
30. *philippinensis* Delfinado*
31. *phnomus* Klein**
32. *protuberans* Delfinado**
33. *pseudomediofasciatus* (Theobald)*
34. *pseudovarietas* Reinert**
35. *rami* Barraud**
36. *sabahensis* Reinert**
37. *seculatus* Menon**
38. *singularis* (Leicester)**
39. *sohni* Reinert**
40. *spermathecus* Wijesundara
41. *torosus* Delfinado**
42. *uncus* (Theobald)*
43. *vallistris* Barraud*
44. *varietas* (Leicester)**
45. *virilis* (Leicester)**
46. *yerburyi* Edwards*

SECTION B

1. *abditus* Barraud**
2. *consonensis* Reinert**
3. *fragilis* (Leicester)**
4. *hamistylus* Laffoon**
5. *indecorabilis* (Leicester)**
6. *nobukonis* Yamada*
7. *pahangi* Delfinado**
8. *ramalingami* Reinert**
9. *robertsi* Laffoon***
10. *stungus* Klein**
11. *uniformis* (Theobald)*
12. *yusafi* Barraud**

SPECIES TREATMENT

AEDES (VERRALLINA) ABDITUS BARRAUD
(Figs. 2, 22)

The following information on the holotype female supplements the descriptions of Barraud (1931: 615, 1934: 282).

FEMALE. *Head.* Antenna 1.42 length of proboscis, pedicel brown with a few small brown scales and short fine brown hairs mesally; maxillary palpus 0.2 length of proboscus; proboscus 0.84 length of femur I; eyes separated in front. *Thorax.* Scutum nearly completely denuded of scales but a few narrow curved reddish-black scales remain, similar scales on each lobe of scutellum; antepronotum with scales rubbed off but scars present; postpronotum without scales, 3-4 dark posterior setae; postspiracular area without scales, 3-4 dark setae; subspiracular area, paratergite, mesomeron and metameron bare; prealar knob without scales, 4-6 dark setae; mesepimeron with a large patch of broad white scales near center, 5-6 dark setae dorsad of scale patch. *Legs.* Posttarsi I-III each with 2 ungues, equal and each with a tooth. *Abdomen.* Terga I-V each dark brown scaled and with a narrow lateral stripe of creamy-white scales; sterna II-V each creamy-white scaled; remainder of abdomen removed with genitalia. *Genitalia.* As in Figure 2.

DISCUSSION. The adult habitus of *abditus* is similar to that of *indecorabilis* but differs as follows: *abditus* with a lateral narrow stripe of creamy-white scales on abdominal terga and sterna with creamy-white scales, while *indecorabilis* possesses a lateral broad stripe of whitish scales on abdominal terga and sterna with creamy-brown scales.

Female genitalia of *abditus* are illustrated in order to show all structures including the lower vaginal lip and sclerites, terga VIII and IX, sternum VIII and seminal capsules. Distinctive parts of the genitalia of this species are compared to the other members of Section B in Figures 21 and 22.

AEDES (VERRALLINA) ADUSTUS LAFFOON
(Figs. 25, 36, 48, 58, 60)

FEMALE. No differences could be found between the adults and the genitalia of *adustus* and *andamanensis*.

PUPA (Fig. 36). Chaetotaxy as figured and recorded in Table 2. Ocular plate with moderately developed cuticular facets. *Respiratory trumpet.* Moderately pigmented; hair-like spicules on distal 0.38-0.51 of inner surface; index 3.47-4.22, average 3.85. *Abdomen.* Setae 6, 9-VII weakly developed; 4-VIII single to 4 branched, usually double; 9-VIII single. *Paddle.* Ovoid; small serrations on distal portion of basal 0.61-0.63 of outer margin; tiny spicules on apical 0.37-0.39 of outer and apical 0.12-0.21 of inner margins; midrib nearly reaches apex; seta 1-P single; index 1.32-1.61, average 1.51.

LARVA (Fig. 48). Chaetotaxy as figured and recorded in Table 15. *Head.* Seta 4-C with 5-8 branches; 5-C with 6-10 branches; 6-C with 4-7 branches; 7-C with 10-14 branches; 12-C with 4-9 branches; dorsomentum with 33-35 teeth. *Antenna.* Moderately long, moderately pigmented, with several scattered small spicules, more numerous on basal area; seta 1-A with 4-6 branches, moderately long, branches thickened; 2-A long, with a subapical constriction; 3-A short, 0.29-0.39 length of 2-A; 4-A moderately long, 0.50-0.69 length of 2-A; 6-A short, 0.26-0.37 length of 2-A. *Thorax.* Seta 1-P long and single. *Abdomen.* Seta 1-VIII with 4-6 branches; 3-VIII with 5-11 branches; 5-VIII with 5-8 branches; 2-X with 6-12 branches, all approximately equal in length; ventral brush with 9-11 setae on grid and 2-3 precratal shorter ones, all multiple branched, usually with 10 setae on grid and 2 precratal ones; saddle moderately pigmented, incompletely rings segment X, acus absent; 4 moderately long to long anal papillae; comb with 7-15 (usually 10) scales arranged in a single curved irregular row, each scale with a stout median apical spine and small denticles on laterobasal areas. *Siphon.* Moderately pigmented; acus well developed; index 2.73-3.50, average 3.11; pecten on basal 0.56-0.59 of siphon, composed of 14-18 (usually 15) teeth, apical 2-4 teeth longer and wider spaced than remainder of teeth, each tooth long, slender and with 1-2 small stout ventral denticles near base; seta 1-S short, triple to 5 branched, base attached on basal 0.66-0.76 of siphon distad of last pecten tooth.

DISCUSSION. *Aedes adustus*, previously reduced to a synonym of *andamanensis* by Delfinado (1967: 9), is here resurrected from synonymy on characters of the male genitalia. This species belongs to a species complex (i.e. *adustus, andamanensis, johnsoni, margarsen* and *sohni*) in which the members have previously been difficult to separate from each other. The types of these 5 species have been examined. *Aedes adustus* is separated from the other members of the complex by the presence of a short spine-like apical sternomesal projection on the basal mesal lobe (Fig. 25). The development of the basal mesal lobe of *adustus* is intermediate between *andamanensis* and *sohni,* both of which lack an apical sternomesal projection, and *johnsoni* and *margarsen,* both of which have a long, slightly curved, knife-like, apical sternomesal projection. *Aedes adustus* occupies much of the same geographical range as *andamanensis,* however, all specimens of this group examined from Sabah were *adustus* (except for the holotype male of *sohni*). Since females of the above 2 species can not be separated with certainty they are recorded as *andamanensis* Group.

Adults of this complex (*andamanensis* Group) are easily distinguished by the presence of fine hairs on the metameron from the other species in the subgenus except *gibbosus* which also has hairs and a few scales on this structure. *Aedes gibbosus,* however, is easily separated from this group by features of the male genitalia, absence of scales on the antepronotum and postspiracular area and the absence of setae on the prosternum while members of the *andamanensis* Group have scales on the antepronotum and postspiracular area and setae on the upper mesal area of the prosternum (setae absent in *johnsoni*).

Illustrations are given of tarsomeres 5 and posttarsi of the male (Fig. 58) and the female (Fig. 60).

The pupa and larva of *adustus* are described for the first time and are similar to those of *andamanensis.*

DISTRIBUTION. 168 specimens examined: 55♀, 54♂, 33 L, 21 with associated skins (16 p, 5 l).

CAMBODIA. *Kompong Sela,* Stung Chral; 2♂.

MALAYSIA. *Kedah,* Kg. Peng Besar, Kuala Nerang; 1♂. *Kelantan,* Kg. Siupol, Mochang; 3♂. *Malacca,* Taugga Batu; 5♂. *Negri Sembilan,* Kg. Kuala Johol, Kg. Tengah, Tampin; 3♂. *Perlis,* Kg. Gunong; 1♂ pl, 2♂. *Sabah,* Apin, Beaufort, Jesselton, Keningau, Kota Belud, Bandau, Kudat, Labuk and Sugut, Papar, Pulau Labuan, Rangan, Sandakan, Mount Pyramid, Mount Tiger, Kg. Gading, Tawan, Tenam; 1♀ pl, 2♀ p, 46♀, 2♂ pl, 1♂ p, 12♂, 33 L.

PHILIPPINES. *Balabac Island,* Cape Melville; 6♀ and 5♂ (paratypes), 1♂ (holotype) and 1♂ with asymmetrical genitalia (see Laffoon 1946: 234, 236).

THAILAND. *Chiang Mai,* Ban Rong Rua Taeng; 1♂ p. *Khon Kaen,* Tham Pho Ti Yan; 1♂. *Krabi,* Ban Phru Toei; 6♂ p. *Phangnga,* Pak Chaung; 1♂ p. *Prachin Buri,* Ban Bu Phram, Ban Tub Lan; 1♂ pl, 4♂ p. *Songkhla,* Amphoe Haad Yai, Ton Nga Chang Waterfalls; 1♂ p.

BIOLOGY. In Malaysia immatures were collected from a small wheel rut and from a marshy depression with buffalo footprints; from colored, fresh, unmoving, temporary water in partially shaded areas located in nipa palm and rubber plantations; and at elevations from sea level to 213 m (most often at sea level). Adults were taken biting humans (on legs) between 1900-2000 hours (1 April 1967) and resting in nipa palms between 1000-1100 hours (27 March 1967).

In Thailand immatures were collected from small ground pools, a small ditch and elephant footprints; from clear or turbid, fresh, unmoving, temporary water in partially to heavily shaded areas located in secondary scrub, in hilly and valley terrain; and at elevations from 80-330 m.

AEDES (VERRALLINA) AGRESTIS BARRAUD
(Fig. 3)

DISCUSSION. Only the female genitalia, which were mounted in Canada balsam on a microscope slide, remains of the holotype in the BMNH (Peter Mattingly, 21 May 1973, personnal communication). Therefore, since additional specimens have not been collected, no additional information on the adult habitus can be added to the original description of Barraud (1931). The female genitalia have been examined and are illustrated (Fig. 3) showing for the first time the development of the lower vaginal lip and lower vaginal sclerite. The latter consists of a large, heavily pigmented plate with a deep median apical indentation. The development of the spermathecal eminence is unique for this species.

AEDES (VERRALLINA) ANDAMANENSIS EDWARDS
(Figs. 23, 25, 56, 58, 60)

DISCUSSION. *Aedes andamanensis* belongs to a group of closely related species (i.e. *adustus, johnsoni, margarsen* and *sohni*) but can be separated from the other members of the complex by characters of the male genitalia (Figs. 25 and 56) and from all except *adustus* by its geographical distribution (see discussion under *adustus*).

Illustrations are given of the tarsomeres 5 and posttarsi of the male (Fig. 58) and the female (Fig. 60).

The male genitalia illustration of *andamanensis* by Delfinado (1967, Fig. 2) is *adustus*.

Additional distribution and biology information is given below.

DISTRIBUTION. 63 specimens examined: 40♂, 16 with associated skins (9 p, 7 l).

INDIA. *Andaman Islands;* 1♂ (holotype).

INDONESIA. *Java,* Padaberang; 1♂. *Sumatra,* Atchin, Kotta Tjane; 1♂.

MALAYSIA. *Kedah,* Kg. Peng Besar, Kuala Nerang; 1♂ p, 1♂. *Kelantan,* Kg. Siupol, Mochang, Pasir Puteh, Selising; 2♂. *Malacca,* Malacca, Taugga Batu; 1♂ pl, 5 ♂. *Negri Sembilan,* Kg. Kuala Johol, Kg. Marjid Tengah, Tampin; 2♂. *Pahang,* Bt. Betong, Kuala Lipis, Merapah, Gna Mueang; 1♂ p, 1♂. *Perlis,* Bukit Pintang Forest Reserve, Kg. Gunong; 1♂ p, 3♂.

THAILAND. *Chiang Mai,* Amphoe Maerim, Ban Rong Rua Taeng; 2♂ p. *Kanchanaburi,* Ban Sai Yok; 1♂ p. *Khon Kaen,* Pha Dong Larn, Tham Pho Ti Yan; 5♂. *Krabi,* Ban Phru Toei; 5♂ pl. *Nakhon Ratchasima,* Ban Wang Mut; 1♂ p. *Phangnga,* Pak Chaung; 2♂. *Prachin Buri,* Ban Bu Phram; 1♂ pl, 2♂ p.

BIOLOGY. The preferred habitat of immatures appears to be small, fresh water, flood and ground pools in partial to heavily shaded areas. In Thailand immatures were collected from small and large flood pools, a small ditch, small animal footprints, elephant footprints, large wheel ruts, flood pools in dry stream beds; from clear or turbid, fresh, unmoving, temporary water in partially to heavily shaded areas (once from an unshaded area); in secondary scrub forests and once each from the following: secondary rain forest, rubber plantation, and a fruit, banana and pineapple farm; and at elevations from 80-350 m (most often at 100-350 m).

In Malaysia immatures were collected from small and large ground and flood pools, small pools in a dry stream, small buffalo footprints, and a small wheel rut; from clear or colored, fresh, unmoving, temporary water in partially to heavily shaded areas (3 times from unshaded areas) located in secondary rain forests; and at elevations from sea level to 61 m.

AEDES (VERRALLINA) ANDAMANENSIS GROUP

DISCUSSION. The females of *andamanensis* and *adustus* can not be separated by either habitus or genitalia features. These 2 species also occupy much the same geographical areas. *Aedes andamanensis* has not been collected from Sabah, Malaysia, therefore all females of this group from this area are considered to be *adustus*. The female of *sohni,* which has been collected from Sabah and southern Thailand, is not known so that the exact status of the females from Sabah are also in doubt. The females of the *andamanensis* Group from Cambodia, Thailand and West Malaysia are listed below. Many additional specimens of progeny reared adults with associated immature skins from a number of different localities within the range of these 2 species will be required in order to understand this species complex.

DISTRIBUTION. 181 specimens examined: 87♀, 15 L, 47 with associated skins (15 p, 32 l).

CAMBODIA. *Kompong Sela,* Stung Chral; 2♀.

MALAYSIA. *Kedah,* Kg. Peng Besar, Kuala Nerang; 1♀. *Kelantan,* Pasir Puteh, Selising; 1♀ pl, 2♀, 7 L. *Malacca,* Malacca, Taugga Batu; 6♀ pl, 8♀, 6 L. *Negri Sembilan,* Kg. Kuala Johol, Kg. Marjid Tengah, Tampin; 6♀, 2 L. *Pahang,* Merapoh; 2♀. *Perak,* Chior Forest Reserve; 1♀. *Perlis,* Kg. Gunong, Kg. Prok Buah; 4♀ pl, 1♀ p, 1♀.

THAILAND. *Khon Kaen,* Pha Dong Larn, Tham Pho Ti Yan; 3♀. *Krabi,* Ban Phru Toei; 7♀ pl. *Nakhon Ratchasima,* Ban Wang Nam Khea; 6♀ pl, 1♀. *Nakhon Si Thammarat,* Amphoe Chawang, Banna Nabon, Ban Tan; 3♀. *Nan,* Ban Ta Loc, Pha Dang Khawi; 2♀ pl, 1♀. *Phangnga,* Pathum; 1♀ p, 5♀. *Prachin Buri,* Ban Bu Phram, Ban Tub Lam; 6♀ pl, 9♀ p, 1♀. *Songkhla,* Amphoe Haad Yai, Ton Nga Chang Waterfalls; 4♀ p, 2♀. *Trang,* Trang; 1♀.

BIOLOGY. In Thailand females were collected biting cattle and horses.

AEDES (VERRALLINA) ATRIUS BARRAUD
(Fig. 23, 60)

DISCUSSION. Tarsomeres 5 and posttarsi of the female (Fig. 60) and tergum IX of the female genitalia (Fig. 23) are illustrated for the first time.

Many of the following specimens represent new distribution records in Thailand. Additional information on the biology of this species is also given.

DISTRIBUTION. 73 specimens examined: 23♀, 17♂, 1 l, 4 L, 19 with associated skins (10 p, 9 l).

THAILAND. *Chiang Mai,* Chiang Mai, Doi Sutep; 2♀. *Chon Buri,* Amphoe Bang Lamung, Khao Mai Keo, Khao Wai; 1♀. *Lampang,* Ban Pak Hoi, Ban Pha Mon, Ban Rai Na Dieo; 1♀ p, 4♀, 1♂ pl, 3♂. *Nakhon Nayok,* Amphoe Muang, Khao Tha Kor, Pha Kluay Mai Waterfalls; 3♀ p, 5♀, 1♂ pl, 1♂ p, 3♂, 2L. *Nakhon Ratchasima,* Amphoe Pak Chong, Dong Chao Thong, Kong Koa Waterfalls, Lam Nam Tha Klong; 2♀, 1♂, 1 l, 2 L. *Nan,* Ban Pha Mon; 1♂. *Phuket,* Khao Prathiu; 1♀ pl, 1♀, 3♂ pl. *Tak,* Khao Salak Phra; 1♀ pl, 1♀ p, 1♀, 2♂ pl, 1♂.

BIOLOGY. In Thailand immatures were collected from small and large flood pools in dry stream beds and small rain water puddles containing clear or turbid, fresh, unmoving, temporary water with dead leaves, in partially to heavily shaded areas located in primary and secondary rain forests and a secondary deciduous forest and at elevations from 85-823 m (most often at 120-250 m). Adults were collected biting man in a forest between 1515 and 1545 hours.

AEDES (VERRALLINA) BUTLERI THEOBALD
(Figs. 4, 26, 37, 49, 56, 58, 60, 63)

Aedes (*Aedes*) *seculatus* Menon 1950, ♀ only synonym *carteri* Wijesundara 1951, Ceylon J. Sci. 24: 176 (♀*) (see discussion section of *seculatus*). NEW SYNONYM.

Aedes butleri is the type species for the subgenus *Verrallina* and the representative species for Series II, Section A, and is therefore completely redescribed below.

FEMALE (Fig. 63). *Head.* Antenna dark brown, 1.01-1.11 length of proboscis, pedicel dark brown with a few small dark scales and short fine hairs mesally, flagellomere 1 with basal 0.25 pale and with several small dark scales near middle, flagellar whorls with 6 dark setae; clypeus dark brown, bare; maxillary palpus blackish-brown scaled, 4 segmented, 0.17-0.21 length of proboscis; proboscis blackish-brown scaled, 1.17-1.24 length of femur I; eyes contiguous; ocular setae blackish-brown and well developed; scales on head all broad and decumbent except upper interocular space which has 6-8 narrow curved white scales (some specimens with these scales pale brown) and occiput with a patch of short erect forked scales, mesal ones dark and lateral ones paler; vertex blackish-brown scaled with a double row of broad white scales on midline extending anteriorly nearly to ocular line (some specimens with only a few white scales); lateral surface blackish-brown scaled with a narrow stripe of white scales extending from area in front of antepronotum to ocular line. *Thorax*. Scutal integument dark brown; scutum covered with narrow curved reddish-black scales except for a small patch of narrow curved white scales on median anterior promontory area; prescutellar space bare; scutellum with a patch of narrow curved reddish-black scales on each lobe; dark reddish-black setae on the following areas: 2-4 median anterior promontory, numerous acrostichal (anterior and posterior), numerous dorsocentral (anterior and posterior), scutal fossal (4-6 anterior, 4-5 lateral and 2 posterior), numerous supra-alar, 5-6 posterior medial scutal, 1 postalar callar and scutellar (5-6 long and 3-4 short ones on lateral lobe, 5-7 long and 4-5 short ones on median lobe); pleural integument dark brown; antepronota widely separated, scales absent, 11-17 long and short dark setae; postpronotum with narrow curved reddish-black scales on upper area, 5-8 posterior dark setae; propleuron with a patch of broad white scales, 9-12 dark setae; prosternum, subspiracular area, paratergite, mesomeron and metameron bare; postspiracular area without scales, 3-8 dark setae; mesepisternum with an upper and a lower patch of broad white scales, several cephalic scales of upper patch show a brownish tinge, 4-5 upper and 14-16 posterior dark setae, a few (3-6) short fine pale hairs forming a small patch cephalad of upper scale patch near subspiracular area; prealar knob without scales, 9-12 dark setae; mesepimeron with a patch of broad white scales near center, 13-15 setae (several hair-like) dorsad of scale patch, several fine golden hairs on areas caudad and below scale patch but not extending over lower area. *Legs*. Coxae I-III each with several dark setae, I with broad brown scales and a small dorsal patch of white ones on anterior surface, II and III each with a patch of broad white scales on outer area of anterior surface; trochanters I-III each with broad pale brown scales; femora I and II each with anterior surface dark brown scaled, I with a broad posterodorsal longitudinal stripe of pale brownish scales, II with a broad posteroventral longitudinal stripe of pale brownish scales, remainder of posterior surfaces of I and II dark brown scaled, III dark brown scaled with an anteroventral broad longitudinal stripe of creamy colored scales from base to near apex, posterior surface with a ventral broad longitudinal pale brownish stripe; tibiae I-III and tarsi I-III blackish-brown scaled; posttarsi I-III (Fig. 60) each with 2 ungues, I and II with ungues equal, each with a tooth, III with ungues equal, both simple. *Wing*. Dorsal and ventral veins with blackish-brown scales; alula with several moderately broad dark brown scales on margin; upper calypter with several pale brown setae on margin; 1 remigial seta. *Halter*. Pedicel pale; capitellum dark brown scaled. *Abdomen*. Terga blackish-brown scaled, laterotergite of I with a rectangular patch of white scales, II-VII each with a lateral white scaled spot, extreme lateral portion of spot basal; sterna brown scaled each with a laterobasal white scaled spot, V-VI also each with a few pale scales on mesal areas; terga and sterna with numerous golden setae, mostly along posterior margins. *Genitalia* (Fig. 4). Tergum VIII moderately pigmented, wide, base and apex both nearly straight, lateral margins slightly concave, several moderately long stout setae apically and a few short ones scattered over apical 0.40-0.57, basolateral seta present, covered with minute spicules, numerous broad scales covering apical 0.70-0.72, basal 0.10-0.35 retracted into segment VII, VIII-Te index 0.59-0.65, VIII-Te/IX-Te index 3.14-3.75; sternum VIII moderately pigmented, wide, base concave, apex with a moderately deep median indentation with a small lobe on each side of midline, numerous short and moderately long setae scattered over apical 0.80-0.87, setae somewhat stouter at apex and on median lobes, also more numerous on the latter, covered with minute spicules, numerous broad scales covering apical 0.83-0.87 except for a small median apical area, apical intersegmental fold unpigmented, VIII-S index 0.65-0.68; tergum IX moderately pigmented, wide, short and band-like, base with a short broad median indentation, apex slightly concave, setae absent, covered with minute spicules, IX-Te index 0.32-0.38; insula unpigmented, short, covered with minute spicules, 4-5 small tuberculi, each with a minute spicule; lower vaginal lip moderately pigmented, narrow, covered with minute spicules, with a small caudally projected heavily pigmented median apodeme, lower vaginal sclerites composed of a basal pair of oblong moderately pigmented structures covered with small spicules on dorsal surface and situated on an elevated portion of the membrane extending over area between the vaginal lip, and a small subapical heavily pigmented transverse bar; upper vaginal lip moderately to heavily pigmented, narrow to moderately broad, posterolateral area produced into a small lobe, posterior and posterolateral lobe covered with minute spicules, upper vaginal sclerite very large, well developed, base attached to basal half of lateral area of upper vaginal lip and with a heavily pigmented apodeme on posterobasal area, sclerite bifurcate with anterior branch wide, moderately pigmented and attached to cephalic portion of spermathecal eminence, posterior branch wide, heavily pigmented with a caudally produced, heavily pigmented, mesally curved arm connected with its mate by a small membranous strip which forms a crown around the spermathecal eminence; spermathecal eminence heavily pigmented, shallow in depth, composed of a pair of comma shaped lateral structures connected caudally and produced into a fleshy very lightly pigmented cephalic projection, moderately long spiny excrescences on lateral and cephalic areas; postgenital lobe short, wide, apex broad with a small median indentation, 14-19 setae on each side of midline, completely covered with small spicules, dorsal PGL index 0.87-1.00, ventral PGL index 1.11-1.21; peri-anal membrane with small spicules; cercus triangular in shape, moderately long and broad at base, apex acute, completely covered with small spicules, dorsal surface with a number of long and moderately long setae and a few short ones on apical 0.91-0.94, ventral surface with a few short setae along outer area, a number (12 or more) of broad scales on dorsal surface, cercus index 2.38-2.72, cercus/dorsal PGL index 3.03-3.43; 3 seminal capsules, 1 large, 1 medium and 1 small in size, heavily pigmented, spherical, each with a short pigmented neck, several small seminal capsule pores near orifice, base of accessory gland duct moderately pigmented.

MALE. Similar to female in general habitus but with the following differences. *Head*. Antenna plumose, 0.97-1.09 length of proboscis; maxillary palpus 0.11-0.14 length of proboscis; proboscis 1.09-1.11 length of femur I; vertex with only 2-3 broad white scales on midline. *Thorax*. Scutellar setae (3-4 long and 3-4 short ones on lateral lobe, 4 long and 4-5 short ones on median lobe); 9-11 antepronotal setae; 4 postpronotal setae; 4-6 propleural setae; 2-3 postspiracular setae; 5-7 prealar knob setae; mesepimeron with 6-8 setae dorsad of scale patch. *Legs*. Posttarsi I-III (Fig. 58) each with 2 ungues, I with ungues unequal, each with a tooth, II with ungues unequal, larger ungue simple and smaller ungue with a tooth, III with ungues equal, both simple. *Abdomen*. Tergum VIII (Fig. 56) wide, caudal lateral area produced into a lobe bearing a patch of very long stout curved setae and median caudal area bearing a patch of moderately long to long stout setae. *Genitalia* (Fig. 26). Tergum IX moderately to heavily pigmented, band-like with median caudal margin slightly concave and strongly fused to tergum X, setae absent, narrowly connected laterally to sternum IX; gonocoxite short, broad, with ventral surface strongly produced sternally, heavily pigmented, mesal surface membranous with minute spicules, dorsal surface with a few very long stout setae on lateral portion of apical area, ventral surface with apex slightly produced caudally and bears 2 long broad heavily pigmented longitudinally striated setae with bases nearly contiguous and apices bluntly pointed and one longer narrower stout lanceolate seta slightly ventrad of other 2, mesal subapical area with a small moderately to heavily pigmented bulla which bears a moderately long sternal arm, a short proximal conical tergal projection and a small distal lump, one moderately long seta between bulla and 2 broad apical striated setae, remainder of ventral surface with numerous short thin setae and a few broad scales, lateral surface with several long stout setae on apical area and a few broad scales on basal area; gonostylus moderately pigmented, long (approximately 1.1 length of gonocoxite), basal area formed into a large lobe with minute spicules and 8-10 short, moderately long and long stout setae, apical portion bifid, produced into a ventral shorter striated blade-like structure with a few minute spicules, and a dorsal narrow arm which is thicker distally and terminates in a short pointed hook, distal area bears 3-5 short thin setae and basal area of arm bears 3 moderately long stout setae, attached to apex of gonocoxite; basal mesal lobe lightly to moderately pigmented, consists of a small basal lobe bearing 8-13 short thin setae, each of which arise from a tubercule, and a small caudal lightly pigmented indistinct area on mesal membrane of gonocoxite bearing 1-3 very short setae, lobe connected mesally with its mate by a narrow moderately pigmented band covered with minute spicules and located ventrad of prosophallus and phallus; proctiger continuous tergally, moderately pigmented, paraproct not separated but restricted to a very heavily pigmented band along the sternal margin of proctiger, apex with 3-6 small heavily pigmented teeth and base with a small short sternal projection which articulates at a point on the dorsomesal surface of the parameral apodeme near base of opisthophallus, cercal setae absent; tergum X moderately to heavily pigmented, strongly fused to caudal margin of tergum IX and base of proctiger, margins indistinct but fusion lines somewhat wrinkled; phallosome complex, opisthophallus--consists of a moderately pigmented tergal transverse bridge between the parameral apodemes, lateral surface curved ventrally, caudal margin with outer area produced into a cup-like lobe, base attached to a dorsomesal extension of the caudal portion of parameral apodeme, located dorsad of phallus and prosophallus and ventrad of proctiger, phallus--consists of a pair of moderately long heavily pigmented arms which are joined near their center by a narrow sternal bridge, apices of arms contiguous giving an A-shaped appearance, base of arm attached to inner tip of paramere, tergal area of arm basad of sternal bridge strongly fused to inner sternobasal portion of prosophallus, apex of phallus with a loosely attached tergal penis filament which consists of a small moderately pigmented U-shaped structure and is produced cephalad, prosophallus--consists of a bulbous base which is fused to tergobasal area of phallus and tergomesal portion of paramere, apical 0.4-0.5 produced into several lightly pigmented flattened contiguous leaf-like structures with apices fused into a single flattened plate which is positioned between laterosternal surface of opisthophallus and lateral margin of phallus, prosophallic arm approximately equal in length to phallic arm, paramere--heavily pigmented, moderately long, approximately 0.67 length of phallic arm, articulates at a point near middle of outer margin with caudal area of parameral apodeme, parameral apodeme--moderately to heavily pigmented, moderately long, outer surface broadly attached to tergobasal apodeme of gonocoxite; sternum IX heavily pigmented throughout, large, broad with apicolateral areas rounded, 6-11 short and moderately long setae in a small patch near middle of caudal margin.

PUPA (Fig. 37). Chaetotaxy as figured and recorded in Table 3. Ocular plate without or with a small area of very poorly developed cuticular facets. Metanotal plate and areas of cephalothorax and first 3-4 abdominal segments heavily pigmented. *Respiratory trumpet.* Heavily pigmented; hair-like spicules on distal 0.75-0.82 of inner surface; index 4.13-5.60, average 4.83. *Abdomen.* Setae 6, 9-VII weakly developed; 4-VIII triple to 5 branched; 9-VIII single. *Paddle.* Ovoid; minute serrations on distal portion of basal 0.62 of outer margin; minute spicules on apical 0.38 of outer and apical 0.3 of inner margins; midrib does not reach apex; seta 1-P moderately long, single; index 1.17-1.58, average 1.33.

LARVA (Fig. 49). Chaetotaxy as figured and recorded in Table 16. *Head.* Seta 4-C triple to 6 branched; 5-C double to 4 branched; 6-C triple to 4 branched; 7-C with 5-7 branches; 12-C with 4-5 branches; dorsomentum with 21-26 teeth. *Antenna.* Moderately long, lightly pigmented, with several small scattered spicules; seta 1-A with 6-9 branches, moderately long; 2-A long, with a subapical constriction; 3-A short, 0.22-0.27 length of 2-A; 4-A moderately long, 0.40-0.56 length of 2-A; 6-A short, 0.22-0.29 length of 2-A. *Abdomen.* Seta 1-VIII triple to 5 branched; 3-VIII with 5-11 branches; 5-VIII with 9-15 branches; 2-X with 6-8 branches all approximately equal in length; ventral brush with 10-11 setae on grid and 2 precratal shorter ones, all multiple branched; saddle moderately pigmented, incompletely rings segment X, acus absent; 4 short anal papillae; comb with 9-14 (usually 12) scales arranged in a single curved irregular row, each scale with 1-2 slightly stouter and longer median apical spines and smaller denticles on laterobasal areas. *Siphon.* Moderately pigmented; acus well developed; index 2.32-2.82, average 2.53; pecten on basal 0.52-0.56 of siphon, composed of 9-12 (usually 10) teeth, apical 2-3 teeth longer and wider spaced than remainder of teeth, each tooth long, slender and with 1-2 small stout ventral denticles near base; seta 1-S short, 4-7 branched, base attached on basal 0.64-0.71 of siphon distad of last pecten tooth.

DISCUSSION. *Aedes butleri* belongs to a species group with *dux, iriomotensis* and *lugubris*. These species are easily separated by features of the male and female genitalia but are more difficult to distinguish by adult habitus features. The following features can be used to separate adult females of the group: *butleri* possesses abdominal terga II-VII with laterobasal white scaled patches, scutellum with narrow curved dark brown scales on each lobe; *iriomotensis* possesses abdominal terga II-VII with laterobasal white scaled patches, scutellum with narrow curved scales on each lobe, scales dark brown on lateral lobes, median lobe dark brown scaled with a small median apical patch of white scales (not reported in the original description by Tanaka and Mizusawa 1973: 633, but present in the 10 paratypes examined); *lugubris* possesses abdominal terga II-VII with laterobasal white scaled patches, II also with a tergobasal white scaled band connected with laterobasal white patch (band on a few specimens incomplete mesally), scutellum with narrow curved dark brown scales on each lobe; and *dux* possesses abdominal terga II-VII with laterobasal creamy-brown scaled patches (terga vary from completely dark brown scaled to creamy-brown scaled patches present, some specimens with laterobasal pale scaled patches reduced or absent on II-V), scutellum with narrow curved dark brown scales on each lobe. The female genitalia of *dux, lugubris* and *iriomotensis* are similar in the development of the spermathecal eminence, the later species being somewhat intermediate in development between the other 2 species.

The description and illustration of *butleri* male genitalia by Edwards *in* Barraud (1934: 296) belong to *lugubris*, as suggested by Laffoon (1946: 244), is here confirmed.

Laffoon (1946: 244) and Huang (1968: 17) report the male midleg posttarsus of *butleri* as having the ungues unequal in size and both simple. I have examined specimens from Malaysia (type-locality), Philippine Islands, Singapore and Thailand and find the midleg posttarsus to always be unequal in size with the larger ungue simple and the smaller ungue with a tooth. The tooth on the smaller ungue is small and may have been overlooked by previous workers.

The specimens from Brunei represent a new record for that country.

TYPE-DATA. The lectotype female of *butleri* in the BMNH bears the following information on the labels: Klang jungle, Sept. [on the underside of a paper circle on which the adult is pinned]; 28.10.99, Selangor, A. L. Butler; K. Selangor (mangroves) swarming; *Aedes Butleri* (Type) Theobald; *Aëdes butleri* Theobald, Hololectotype, P. F. Mattingly, 26: viii: 1955. There is a descrepency in the above data in the month of collection (given as Sept. on one label and as Oct. on another label). *Aedes butleri* was first described by Theobald (1901: 230) from 3 female syntypes. Knight and Hull (1953: 476) noted one of the females was not *butleri* but probably a species in the subgenus *Skusea* Theobald. Mattingly (1956: 794) selected the above lectotype; a paratype with the following data: 28.10.99, Selangor, A. L. Butler, Klang, very common & troublesome; and labeled the third specimen as a paratype (label data as follows: 28.10.99, Selangor, A. L. Butler) and transferred it to *Skusea*, confirming the identification of Knight and Hull.

DISTRIBUTION. 368 specimens examined: 202♀, 71♂, 2 p, 4 l, 28 L, 34 with associated skins (7 p, 27 l).

BRUNEI. *Temburong District*; 4♀ pl, 27♀, 1♂, 12 L.

INDONESIA. *Borneo* (Southeast), Tanah Grogot; 3♀, 1♂ (paratype of *umbrosis*). *Celebes*, Loemae; 1♀. *Ceram*; 1♀. *Java*, Batavia, Kemajoran; 9♀.

MALAYSIA. *Kedah*, Kg. Sungei Lintang; 1♀ pl, 3♀. *Perak*, Maxwell's Hill; 4♀. *Perlis*, Kg. Gunong; 2♀ pl. *Sabah*, Beaufort, Jesselton, Kuala Abai, Kudat, Labuan, Sandakan, Tawau, Tuaran; 13♀, 2♂. *Selangor*, Banting, Carey Island, Kampong Bandar, Klang, Kuala Lumpur, Kuala Selangor, Rantau Panjang, Sg. Bertek, Telak Gong; 1♀ p, 38♀, 1♀ (lectotype of *butleri*), 2♂ pl, 5♂ p, 1♂.

PHILIPPINES. *Basbas Island*; 1♀. *Culion Island*; 1♀, 3 L, 1 l. *Leyte*, Palo, Puerto Princesa, Tacloban; 6♀ pl, 53♀, 1♂ pl, 41♂, 2 p, 7 L, 3 l. *Palawan Island*, Iwahig Penal Colony, Tinabog; 2♀.

SINGAPORE. Macritchie Reservoir; 1♀. West coast road between 8 and 9 miles; 4♀ pl, 17♀, 4♂ pl, 1♂ p, 4♂, 5 L.

SRI LANKA. *Kalutara District*, Matugama; 1♀ (cotype of *carteri*). *Southern Province*, Potwatte Ganga at Denipitiya; 1♀ (specimen of *carteri*).

THAILAND. *Chanthaburi*, Ban Bo Phu; 1♀. *Ranong*, Khao Muang Lak, Muang; 3♀ pl, 2♀, 8♂, 1 L. *Udorn Thani*, Nong Bau; 1♀.

BIOLOGY. In Malaysia immatures were collected from a ground pool, hoofprints along coast, small ditch, ground pool surrounded by nipa palms, small marshy depressions; from clear, colored and turbid, fresh or brackish, unmoving, temporary water in partially shaded areas located in secondary mangroves, costal villages, villages with coconut palms and an orchard plantation; and at elevations from sea level to 45 m.

Immatures in Thailand were collected from small and large ground pools containing clear, fresh or brackish, unmoving, temporary water in partially or heavily shaded areas located in primary mangroves and at elevations from 3-

26 m.

Immatures from Brunei were collected from a small ground pool containing clear, fresh, unmoving, temporary water in a heavily shaded area in a village and at sea level.

Collections of immatures from the Philippines were made from mangrove swamps, swamp rain pools, pool surrounded by nipa palms and a puddle with leaves; from brackish and fresh, unmoving water in partially shaded areas; and at elevations at and near sea level.

In Singapore immatures were collected from small ground pools and a ground pool at base of a coconut palm; from colored, brackish, unmoving, temporary water in partially shaded areas located in an open swamp and a costal village; and at sea level.

Adults have been collected biting man in costal villages, a secondary evergreen forest and a rain forest in Singapore. In the Philippines adults were taken biting man in mangrove swamps and coconut groves. Adults were collected in Malaysia biting man in mangroves, coconut groves, secondary rain forests and a village with nipa palms.

AEDES (VERRALLINA) CAMPYLOSTYLUS LAFFOON
(Figs. 23, 58, 60)

DISCUSSION. The following specimen from New Guinea is the first record of this species outside of the Philippine Islands. This female bears the following information on the labels: NETH. NEW GUINEA, Hollandia, I: 2: 1945, Lot # 496-G, adults biting Sago swamp, 19th Med. Gen. Lab. U. S. Army, L. W. Saylor collector, genitalia preparation number T 73.463.

Structures of *campylostylus* illustrated for the first time are: male posttarsi (Fig. 58), female posttarsi (Fig. 60) and tergum IX of the female genitalia (Fig. 23).

DISTRIBUTION. 82 specimens examined: 34♀, 26♂, 2 p, 2 l, 6 L, 6 with associated pupal and larval skins.

INDONESIA. *New Guinea, West Irian,* Hollandia; 1♀.

PHILIPPINE ISLANDS. *Balabac Island,* Cape Melville; 7♀, 5♂, 1 L (paratypes). *Mindanao,* San Ramon; 1♀, 5♂, 3 L (paratypes). *Mindoro,* San Jose; 1♂ (paratype). *Palawan,* Balsahan River, Irahuan River; 1♂ pl (holotype), 4♀ pl, 19♀, 12♂, 2 pl, 2 L (paratypes), Quezon, Panitian; 2♀, 1♂ pl, 1♂.

BIOLOGY. The new material from Palawan was collected as immatures from a ground pool (1♂ pl) and a rock pool (2♀, 1♂ skins lost).

The female from Hollandia was collected biting man in a Sago swamp.

AEDES (VERRALLINA) CARMENTI EDWARDS
(Figs. 5, 27, 38, 50, 58, 60)

Aedes (*Aedes*) *ceramensis* Brug 1934, Bull. Entomol. Res. 24: 512 (♂ *).
NEW SYNONYM.

Aedes carmenti is the representative species for Series I, Section A, and is therefore completely redescribed below.

FEMALE. *Head.* Antenna dark brown, 0.76-0.83 length of proboscis, pedicel dark brown with a few small dark scales and short fine hairs mesally, flagellomere 1 with basal 0.3 pale and with several small dark scales near middle, flagellar whorls with 6 dark setae; clypeus dark brown, bare; maxillary palpus blackish-brown scaled, 4 segmented, 0.11-0.13 length of proboscis; proboscis blackish-brown scaled, 1.50-1.55 length of femur I; eyes nearly contiguous; ocular setae blackish-brown and well developed; scales on head all broad blackish-brown and decumbent except a row of narrow curved pale brown scales on ocular line, a narrow stripe of broad white scales on lateral surface extending from ocular line to a point anterior of antepronotum, and numerous moderately long dark brown erect forked scales on occiput. *Thorax*. Scutal integument dark brown; scutum covered with narrow curved reddish-black scales except for narrow curved golden-white scales forming a small patch on median anterior promontory area, anterior scutal fossal area, supra-alar area near base of wing and along anterior and lateral margins of prescutellar space; prescutellar space bare; scutellum with a patch of narrow curved reddish-black scales on each lobe; dark blackish-brown setae on the following areas: 4-5 median anterior promontory, numerous acrostichal (anterior and posterior), numerous dorsocentral (anterior and posterior), scutal fossal (3-6 anterior, 6-7 lateral and 2 posterior), numerous supra-alar, 7-8 posterior medial scutal, 1 postalar callar and scutellar (8-11 long and 4-6 short ones on lateral lobe, 6-10 long and 5-7 short ones on median lobe); pleural integument dark reddish-brown; antepronota widely separated, scales absent, 18-28 long and short dark setae; postpronotum with narrow curved reddish-black scales on upper area and a few moderately broad brown ones below, 6-10 long and short dark posterior setae and a patch of short hairs ventrad of scale patch and cephalad of posterior setae; propleuron with a patch of broad white scales, 15-19 long and short dark setae; prosternum, subspiracular area, paratergite, mesomeron and metameron bare; postspiracular area with 6-12 setae; mesepisternum with an upper patch of broad pale brown scales (a few posterior ones white) and a lower patch of broad white scales, 4-7 upper and 15-19 posterior dark setae, a patch of short fine golden hairs cephalad of upper scale patch near subspiracular area; prealar knob with 11-15 dark setae; mesepimeron with a patch of broad white scales near center, 21-31 setae dorsad of scale patch, several brown hairs along posterior and ventral margins of scale patch becoming more numerous posteroventrally but not extending onto lower 0.25 of sclerite. *Legs*. Coxae I-III each with several dark setae, I with anterior surface with broad brown scales and a small dorsal and a ventral patch of white scales, II and III each with a patch of broad white scales on outer area of anterior surface; trochanters I-III each with broad pale brown scales; femora I-II each with anterior surface dark brown scaled, III with anterior surface white scaled with a dorsal longitudinal stripe of dark brown scales extending from base to apex and forming a narrow apical band, I with posterior surface pale scaled with a ventral longitudinal stripe of dark brown scales extending from base to apex, II and III each with posterior surface pale scaled with a narrow dorsal longitudinal stripe of dark brown scales extending from base to apex, stripe broader distally and forms a band on apical 0.12-0.20; tibiae I-III and tarsi I-III each blackish-brown scaled; posttarsi I-III (Fig. 60) each with 2 ungues, I with ungues equal, each with a tooth, II with ungues equal, one with a tooth, III with ungues equal, both simple. *Wing*. Dorsal and ventral veins with blackish-brown scales; alula with several narrow brown scales along margin; upper calypter with several pale hairs on margin; 1-2 remigial setae. *Halter*. Pedicel pale; capitellum brown scaled with pale scales dorsally. *Abdomen*. Terga blackish-brown scaled, laterotergite of I with a rectangular patch of white scales, II-VII each with a lateral white scaled spot, extreme lateral portion of spot basal; sterna dark brown scaled, II-VII each with a laterobasal white scaled spot; terga and sterna with numerous golden setae, mostly along posterior margins. *Genitalia* (Fig. 5). Tergum VIII moderately pigmented, wide, base and apex each slightly concave, several short and moderately long setae on apical 0.46-0.60, a few long setae along apical margin, basolateral seta absent but a small bulla in this location, numerous broad scales covering apical 0.74-0.83, covered with minute spicules, basal 0.3-0.5 retracted into segment VII, VIII-Te index 0.63-0.70, VIII-Te/IX-Te index 3.68-4.09; sternum VIII moderately pigmented, wide, base slightly concave, apex with a moderately deep median indentation with a very small lobe on each side of midline, numerous short and moderately long setae scattered over apical 0.86-0.83, covered with minute spicules, numerous broad scales covering most of apical 0.90-0.94, apical intersegmental fold unpigmented, VIII-S index 0.75-0.80; tergum IX moderately pigmented, wide, short, band-like, base with a short median indentation, setae absent, covered with minute spicules, IX-Te index 0.33-0.39; insula unpigmented, short, covered with minute spicules, 4-5 small tuberculi, each with a minute spicule; lower vaginal lip moderately pigmented, narrow, covered with minute spicules, lower vaginal sclerite composed of a pair of very lightly pigmented small plates, without spicules and somewhat wrinkled; upper vaginal lip lightly to moderately pigmented, moderately broad laterally and narrow posteriorly, posterolateral margin evenly rounded and not lobed, minute spicules on posterior margin, upper vaginal sclerite moderately pigmented, well developed, base attached to basal 0.5 of lateral area of upper vaginal lip, sclerite bifurcate with anterior branch small, lightly pigmented and attached to cephalic portion of spermathecal eminence, posterior branch wide with a caudally produced, lightly pigmented, mesally curved arm connected with its mate and forming a crown around the spermathecal eminence; spermathecal eminence heavily pigmented, shallow in depth, composed of a pair of comma shaped lateral structures connected caudally and produced into a fleshy very lightly pigmented small cephalic projection, spiny excrescences absent; postgenital lobe short, wide, apex broad with a moderately deep median indentation, 11-15 setae on each side of midline, completely covered with minute spicules, dorsal PGL index 0.88-1.08; peri-anal membrane with minute spicules; cercus triangular in shape, moderately long and broad at base, apex acute, base concave, completely covered with small spicules, dorsal surface with a number of short and moderately long setae on apical 0.84-0.90 and a few (1-9) broad scales, a few long setae at apex, ventral surface with a few short and moderately long setae along outer margin and apical area, cercus index 2.64-2.97, cercus/dorsal PGL index 3.46-3.84; 3 seminal capsules, 1 large, 1 medium and 1 small in size, heavily pigmented, spherical, each with a short narrow heavily pigmented neck, a few tiny seminal capsule pores near orifice, base of accessory gland duct moderately pigmented.

MALE. Similar to female in general habitus but with the following differences. *Head*. Antenna plumose, 0.76-0.84 length of proboscis; maxillary palpus 0.11-0.12 length of proboscis; proboscis 1.39-1.56 length of femur I. *Thorax*. Median anterior promontory with 3-4 setae; scutal fossal setae (2-5 anterior, 2-4 lateral and 1 posterior); 6 posterior medial scutal setae; 14-21 antepronotal setae; 4-6 postpronotal setae; 14-18 propleural setae; 5-7 postspiracular setae; 8-10 prealar knob setae; mesepimeron with 14-18 setae dorsad of scale patch. *Legs*. Posttarsi I-III (Fig. 58) each with 2 ungues, I and II with ungues unequal, each with a tooth, III with ungues equal, both simple. *Genitalia* (Fig. 27). Tergum IX moderately pigmented, caudal margin concave mesally, strongly fused to tergum X, setae absent, narrowly connected laterally to sternum IX; gonocoxite short, broad, heavily pigmented, mesal surface membranous with minute spicules, dorsal and ventral surfaces both with a number of short and a few moderately long setae scattered over most of surfaces, a few long stout setae on apical 0.6 of outer margin of dorsal surface and on lateral surface, ventral surface also with a short heavily pigmented spiniform on apicomesal area, this seta arises from a short tubercule, a short stout seta basad of tubercule and a moderately long seta distad of tubercule, several broad scales on basal area becoming more numerous laterally and extending onto lateral surface; gonostylus moderately pigmented, moderately long (approximately 0.68 length of gonocoxite), basal 0.4 expanded and bearing 10-12 short setae, apical 0.6 narrow, curved and tapered to a point, apex slightly recurved; basal mesal lobe lightly to moderately pigmented, consists of a somewhat triangular plate situated on basal mesal area of gonocoxite and bears 7-13 short setae and a small apical lobe bearing 8-11 short setae, sternal margin of plate strongly fused to basomesal margin of ventral surface of gonocoxite, basal mesal lobe connected mesally to its mate by a narrow moderately pigmented band covered with minute spicules and located ventrad of prosophallus and phallus; proctiger continuous tergally, moderately pigmented, paraproct indistinct, not separated or free, base with a small short sternal projection which articulates at a point on the dorsomesal surface of the parameral apodeme near base of opisthophallus, cercal setae absent; tergum X moderately pigmented, strongly fused to median caudal margin of tergum IX and base of proctiger, margins indistinct but fusion lines somewhat wrinkled; phallosome complex, opisthophallus--consists of a moderately pigmented tergal narrow transverse bridge between the parameral apodemes, lateral surface curved ventrally, caudal margin slightly concave to truncate, base attached to a dorsomesal extension of the caudal portion of parameral apodeme, located dorsad of phallus and prosophallus and ventrad of proctiger, phallus--consists of a pair of moderately long heavily pigmented arms which are joined near their center by a narrow sternal bridge, apices of arms contiguous giving an A-shaped appearance, base of arm attached to inner tip of paramere, tergal area of arm (basad of sternal bridge) strongly fused to inner sternobasal portion of prosophallus, apex of phallus with a loosely attached tergal penis filament which consists of a large moderately pigmented U-shaped structure and is produced cephalad, prosophallus--consists of a bulbous base which is fused to tergobasal area of phallus and tergomesal portion of paramere, apical 0.5-0.6 produced into several lightly pigmented flattened contiguous leaf-like structures with apices fused into a single plate which extends caudad of posterior margin of opisthophallus, base is positioned between laterosternal surface of opisthophallus and lateral margin of phallus, prosophallic arm approximately equal in length to phallic arm, paramere--heavily pigmented, short, approximately 0.46 length of phallic arm, articulates at a point near middle of outer margin with caudal area of parameral apodeme, parameral apodeme--moderately pigmented, moderately long, outer surface broadly attached to tergobasal apodeme of gonocoxite; sternum IX moderately pigmented throughout, large, broad, apicolateral areas rounded, 9-12 short and moderately long setae in an enlongate patch near middle of caudal margin.

PUPA (Fig. 38). Chaetotaxy as recorded in Table 4. Ocular plate with area of moderately developed cuticular facets. *Respiratory trumpet.* Heavily pigmented; hair-like spicules on distal 0.54-0.60 of inner surface; index 3.19-4.28, average 3.81. *Abdomen.* Setae 6, 9-VII weakly developed; 4-VIII double to 4 branched; 9-VIII triple to 6 branched. *Paddle.* Ovoid; minute serrations on distal portion of basal 0.57 of outer margin; minute spicules on apical 0.43

of outer and apical 0.3 of inner margins; midrib does not reach apex; seta 1-P moderately long, single or double; index 1.14-1.55, average 1.38.

LARVA (Fig. 50). Chaetotaxy as figured and recorded in Table 17. *Head.* Seta 4-C with 6-10 branches; 5-C triple to 7 branched; 6-C triple; 7-C with 8-11 branches; 12-C triple to 6 branched; dorsomentum with 36-41 teeth. *Antenna.* Moderately long, lightly to moderately pigmented, with small spicules scattered over shaft, more numerous on basal area; seta 1-A triple to 5 branched; 2-A long, with a subapical constriction; 3-A short, 0.20-0.31 length of 2-A; 4-A moderately long, 0.57-0.74 length of 2-A; 6-A short, 0.27-0.35 length of 2-A. *Abdomen.* Seta 1-VIII with 5-8 branches; 2-X triple, one branch longer than other 2; ventral brush with 10 setae on grid and 2 precratal shorter ones, all multiple branched; saddle moderately pigmented, incompletely rings segment X, acus absent; 4 moderately long anal papillae; comb with 10-14 (usually 12-14) scales arranged in a single curved irregular row, each scale with small uniformly developed denticles on lateral and apical areas. *Siphon.* Moderately pigmented; acus well developed; index 3.00-3.49, average 3.29; pecten on basal 0.59-0.64 of siphon, composed of 12-16 (usually 13-15) teeth, apical 3 teeth longer and wider spaced than remainder of teeth, each tooth long, slender and with 1-2 small stout ventral denticles near base, distal 2-4 teeth with or without denticles; seta 1-S short, double to 4 branched, base attached on basal 0.70-0.72 of siphon distad of last pecten tooth.

DISCUSSION. Adults of *carmenti* show considerable variation in habitus and are superficially very similar to a number of other species of Series I, Section A. Characters for separating this species from related forms are given in a key by Huang (1968). The male genitalia of *carmenti* and *embiensis* appear to be identical (see discussion section of *embiensis*).

Upon comparison of the 2 cotype males of *ceramensis* with the lectotype and numerous specimens of *carmenti* from Guadalcanal, Solomon Islands, I found no difference in the male habitus or genitalia and therefore consider them conspecific. *Aedes ceramensis* was described as a new species by Brug (1934: 512) from 2 males collected from Ceram. King and Hoogstraal (1947: 115) synonymized *ceramensis* with *carmenti*; however, Belkin (1962: 417) considered the 2 to be distinct species. Huang (1968: 22) followed Belkin's determination of the species. The figure of the male genitalia by Brug (1934: 512) is a distorted view, especially of the basal mesal lobe. Since Belkin apparently did not examine the cotype specimens of *ceramensis* and relied only on the published figure he was mislead into believing they were different from *carmenti*.

The female genitalia of *carmenti* and the other members of Series I, Section A, are very uniform in development and many species do not display any consistant differences with which to separate them; however, the shape of tergum IX is useful in distinguishing a number of species. Figure 24 illustrates the difference in shape of tergum IX of several species in Series I.

Tarsomeres 5 and posttarsi of several species of Series I are illustrated (Figs. 58, 59, 60, 61, 62) for the first time and can be compared to other members of the series.

Larvae of *carmenti* and most other members of Series I (*funerus, mccormicki, multifolium, parasimilis, sentanius* and *similis*) have setae 2-X with one branch noticeably longer than the other branches. Three species (*foliformis, lineatus* and *variabilis*), however, have the branches of setae 2-X approximately equal in length, a feature common to members of Series II and III. Seta 2-X is single in *cuccioi* and double in *trispinatus*.

TYPE-DATA. Type female in BMNH bears the following information on the labels: *Aedes* (*Aedes*) *carmenti* Edw., Type H. T., Solomon Is.: Guadalcanal I., Dr. A. G. Carment, B. M. 1923-610. I have examined the type and it has the abdomen and genitalia missing and is pinned with a minuten pin through the venter of the thorax and extended through the scutum.

Edwards (1924: 388) did not report the designation of a type in his original description of *carmenti* but he recorded numerous females taken in brush and in native houses by Dr. A. G. Carment at Maravovo, Guadalcanar [sic] I., Solomon Is., vi. 1923 and one female collected by G. F. Hill on Palm Island, N. Queensland. King and Hoogstraal (1947: 115) reported the following for *carmenti* "Type female, with numerous other specimens, from Maravova, Guadalcanal, Solomon Islands, and one female from Palm Island, North Queensland, Australia." Belkin (1962: 416) recorded the following for this species "TYPE: lecttype ♀, marked as type by Edwards, Maravovo, Guadalcanal, Solomon Islands, taken in brush or native house, June 1923, A. G. Carment; by present selection (BMNH)." Huang (1968: 18) mistakenly took the statement by King and Hoogstraal (1947) as a lectotype designation.

Lectotype designation is here made for one of the cotype males of *ceramensis* and it bears the following information on the adult labels: Ceram, Oewin, 3.i.1932, De Rook [collector], B.M. 1934-45, 2697 [collection number], cotype, Larvae in swamp of virgin forest, *Aëdes* (*Aëdes*) *ceramensis* Brug, LECTOTYPE ♂ selected by J. F. Reinert, July 1974. Paralectotype designation is made for the other cotype male which possesses the following label data: Ceram, Warasiwa, Brug & De Rook [collectors], 2696 [collection number], cotype. The lectotype is in good condition but it has the 3 left legs and the left wing missing. One wing, a thoracic fragment and genitalia remain of the paralectotype. The genitalia are mounted on small points which are attached to the adult pins, those of the lectotype are in good condition but those of the paralectotype are smashed and distorted and were probably used by Brug in making his Figure 8b. Both types are in the BMNH.

DISTRIBUTION. 415 specimens examined: 322♀, 57♂, 3 p, 6 l, 13 L, 7 with associated pupal and larval skins.

AUSTRALIA (and Trust Territories). *Admiralty Islands*, Los Negros; 66♀. *Bougainville Island* (Solomon Islands), Empress, Augusta Bay; 43♀, 18♂, 5 L. *New Britain*, Cape Hoskins; 29♀. *New Guinea*, *Papua*, Ladova, Milne Bay area; 13♀, 3♂, 2 pl. *Queensland*, Palm Island; 1♀.

INDONESIA. *Ceram*, Oewin, Warasiwa; 2♂ (lectotype and paralectotype of *ceramensis*). *New Guinea*, Hollandia, Lake Sentani, Tor River; 6♀ pl, 41♀, 1♂ pl, 3♂, 3 l, 6 L.

SOLOMON ISLANDS (British Protectorate). *Guadalcanal Island*, Belasuma River, Koli Ar., Teneru Ar.; 101♀, 17♂, 1 pl. *New George*, Munda; 21♀, 1♀ (lectotype), 13♂, 2 L.

BIOLOGY. Immatures were collected from water in a grassy road rut in New Guinea.

In the Solomons the immatures are apparently adapted to breeding in shallow, heavily shaded, jungle pools which are frequently flushed (Belkin 1962: 417). Additional information on the biology of this species in the Solomons is given by Belkin (1962: 417) and in New Guinea by Huang (1968: 21).

Females in the Solomons attacked man voraciously in forested areas during the daytime (Belkin 1962: 418). Similar feeding habits of the females were observed by Huang (1968: 21) for this species in New Guinea.

AEDES (VERRALLINA) CAUTUS BARRAUD
(Fig. 6)

The following information is based on the lectotype male, paratype (cotype) female and one other paratype female and supplements the descriptions of Barraud (1928: 368, 1934: 288).

FEMALE. *Head.* Antenna 1.08 length of proboscis, pedicel brown with a few small brown scales and short fine brown hairs mesally; maxillary palpus 0.18 length of proboscis; proboscis 0.98 length of femur I; eyes contiguous in front. *Thorax.* Scutum covered with narrow curved reddish-black scales except for small patches of narrow curved creamy-white scales on median anterior promontory area, anterior scutal fossal area and on supra-alar area above paratergite; scutellum with narrow curved reddish-black scales on each lobe in specimen labeled cotype and a few creamy-white scales mixed with dark ones in specimen labeled paratype; antepronotum with scales absent, 12-13 dark setae; postpronotum with narrow curved reddish-black scales on upper area, 4-7 dark posterior setae; propleuron with a patch of broad white scales, 9-10 setae; prosternum, subspiracular area, paratergite, mesomeron and metameron bare; postspiracular area with scales absent, 5-6 dark setae; mesepisternum with a large upper and a small lower patch of broad white scales, 4 upper and 9-10 posterior setae, lower ones shorter; mesepimeron with a large patch of broad white scales near center, 7-10 golden setae dorsad of scale patch, 2-4 small golden hairs near lower posterior corner of scale patch. *Abdomen.* Sterna white scaled with a few apical brown scales.

MALE. *Head.* Antenna 0.88 length of proboscis; maxillary palpus 0.11 length of proboscis; proboscis 1.02 length of femur I.

DISCUSSION. The adult habitus of *cautus* is very similar to *pseudomediofasciatus* and *sabahensis*, new species. There appears to be no consistant differences between the habitus of the adults of the former 2 species; however, distinctive differences exist between the genitalia of both males and females (see discussion section of *sabahensis* for separation of it from *cautus* and *pseudomediofasciatus*).

The above additions to the descriptions of Barraud (1928, 1934) are given because the female description of Delfinado (1967: 13) was based on a mixture of females of *cautus* and *sabahensis*. Her illustration (Fig. 18) of *cautus* is also that of *sabahensis*. The present illustration (Fig. 6) was drawn from the female specimen labeled cotype of *cautus*. Delfinado (1967: 13) reported this species from Thailand and North Borneo; however, after examination of these specimens the Thailand females were found to be a mixture of *andamanensis* Group, *atrius*, *vallistris* and *varietas* and the North Borneo specimen was *sabahensis*. No material of *cautus* from Thailand, Malaysia or North Borneo was found in the USNM, SEAMP or BMNH collections. This species is probably restricted to the Indian area.

DISTRIBUTION. 3 specimens examined: 2♀, 1♂.

INDIA. *Bombay Deccan*, Tavargatti; 1♀ (cotype), 1♀ (paratype), 1♂ (lectotype).

AEDES (VERRALLINA) CLAVATUS BARRAUD
(Figs. 23, 39, 58, 60)

PUPA (Fig. 39). The following description and Table 5 are the first description of the pupa of this species. Pupal skins from females have heavily pigmented areas on the cephalothorax, abdominal segments and base of paddles, while those of males lack heavily pigmented areas on the abdominal segments. *Respiratory trumpet.* Moderately pigmented; index 3.21-3.88, average 3.61. *Abdomen.* Setae 6, 9-VII weakly developed; 4-VIII double or triple; 9-VIII double to 4 branched. *Paddle.* Ovoid; minute serrations on distal portion of basal 0.6 of outer margin; minute spicules on apical 0.4 of outer and apical 0.28 of inner margins; midrib does not reach apex; seta 1-P moderately long, single; index 1.32-1.58, average 1.4.

DISCUSSION. The male genitalia are very distinctive in having the proctiger divided into a long stout caudally produced tergal arm and a moderately long stout mesally produced sternal arm which is directed over the lateral portion of the phallosome and is difficult to see in an undissected preparation. The proctiger articulates with the parameral apodeme at a point on the base of the sternal arm.

The following structures of *clavatus* are illustrated for the first time: male posttarsi (Fig. 58), female posttarsi (Fig. 60) and tergum IX of the female genitalia (Fig. 23). Tergum IX of the female genitalia occasionally with a single short seta on one side.

Additional information on the distribution and biology of this species is listed below.

DISTRIBUTION. 33 specimens examined: 17♀, 6♂, 10 with associated pupal skins.

CAMBODIA. *Kompong Sela,* Stung Chral; 4♀.

SOUTH VIETNAM. *Kon Tum*; 2♀. *Pleiku,* Plei Djereng; 2♀.

THAILAND. *Chon Buri,* Amphoe Bang Lamung, Khao Mai Keo, Khao Wai; 1♀, 2♂. *Nakhon Ratchasima,* Khlong Phai, Pak Thong Chai; 4♀ p, 1♂ p. *Nakhon Si Thammarat,* Amphoe Chawang, Khao Luang, Ban Tha Phon; 1♀. *Ranong,* Khao Chatri; 1♂ p. *Satum,* Khlong Baraket; 2♀ p, 2♂ p. *Trang,* Amphoe Muang, Tong Ka Beau; 1♀.

BIOLOGY. In Thailand immatures were collected from crab holes, a flood pool and stream pools in dry streams (filled with rain water); from clear or colored, fresh, unmoving, temporary water in heavily shaded areas; located in mountainous and valley terrain, in primary and secondary rain forests; and at elevations from 75-540 m (most often at 75-80 m). Adults were taken in biting collections between 1100-1200 hours and in light traps.

In South Vietnam adults were collected from light traps.

AEDES (VERRALLINA) COMATUS BARRAUD
(Fig. 3)

The following information is based on the holotype female and supplements the original description of Barraud (1931: 615).

FEMALE. *Head.* Antenna 0.94 length of proboscis; maxillary palpus 0.18 length of proboscis; proboscis 1.22 length of femur I. *Thorax.* Following setae present: 4 median anterior promontory; numerous acrostichals (anterior and posterior); numerous dorsocentrals (anterior and posterior); scutal fossal (5 anterior, 4-5 lateral and 1-2 posterior); numerous supra-alar; 6 posterior medial scutal; 1 postalar callar; scutellar (4 or 6 long and 3-4 short ones on lateral lobe, 6 long and 4 short ones on median lobe); 15 or 17 antepronotal; 5-6 postpronotal; 20 propleural; 5 or 8 postspiracular; 5 upper and 15 or 19 posterior mesepisternal; 7 on prealar knob; and mesepimeron with 18-19 dorsad of scale patch and numerous hairs caudad of and below scales.

Prosternum, subspiracular area, paratergite, mesomeron and metameron bare. *Wing.* Remigium with 1 brown seta. *Genitalia* (Fig. 3). Distinctive, as illustrated.

DISCUSSION. The female genitalia of *comatus* are distinctive for the species. The genitalia are illustrated, the lower vaginal lip and sclerites for the first time.

DISTRIBUTION. Known only from the holotype and type-locality.

AEDES (VERRALLINA) COMOSUS NEW SPECIES
(Fig. 7)

FEMALE. *Head.* Antenna dark brown, 0.87 length of proboscis, pedicel dark brown with a few small dark scales and short fine brown hairs mesally, flagellomere 1 with basal 0.23 pale and with several small brown scales near middle; clypeus dark brown, bare; maxillary palpus dark brown scaled, 0.2 length of proboscis; proboscis dark brown scaled, 1.18 length of femur I; eyes contiguous; ocular setae blackish-brown and well developed; scales on head all broad, blackish-brown and decumbent except for a few narrow curved white scales along coronal suture and on upper area of interocular space, broad white scales on occiput, similar scales forming a stripe on area in front of antepronotum and extending to ocular line, a few broad pale scales on postgena, and a number of dark brown erect forked scales on occiput. *Thorax.* Scutal integument dark reddish-brown; scutum somewhat rubbed mesally, but otherwise covered with narrow curved dark reddish-brown scales except for narrow curved golden scales on the following: small patch on median anterior promontory area, small patch on anterior scutal fossal area, patch on supra-alar area and a small patch on posterior medial scutal area; scutellum with a patch of narrow curved golden-brown scales on each lobe; prescutellar space bare; dark reddish-black setae on the following areas: 5 median anterior promontory, numerous acrostichal (anterior and posterior), numerous dorsocentral (anterior and posterior), scutal fossal (6-8 anterior, 4 lateral and 1 posterior), numerous supra-alar, 4 posterior medial scutal, 1 postalar callar and scutellar (4-5 long and 3-4 short ones on lateral lobe, 5 long and 4 short ones on median lobe); pleural integument dark reddish-brown; antepronota widely separated, scales absent, 10-13 long and short dark setae; postpronotum with a few narrow curved reddish-brown scales on upper area and a few broad reddish-brown ones below, 4-5 dark posterior setae, a few short fine brown hairs cephalad of setae; propleuron with a patch of broad white scales, 23-25 setae; prosternum, subspiracular area, paratergite, mesomeron and metameron bare; postspiracular area without scales, 6 brown setae; mesepisternum with a large upper and a small lower patch of broad white scales (a few scales in upper patch with a brown tinge), 4 upper and 8-10 posterior setae, several short fine brown hairs cephalad of upper scale patch and others ventrad of lower scale patch; prealar knob without scales, 8 brown setae; mesepimeron with a patch of broad white scales near center, 16 brown setae dorsad of scale patch, numerous short fine hairs caudad of and below scale patch but not extending onto lower 0.25 of sclerite. *Legs.* Coxae I-III each with several setae, I with broad brown scales and a small dorsal patch of white ones on anterior surface, II and III each with a patch of broad white scales on anterior surface; trochanters I-III each with several pale brown scales; femora I and II each with anterior surface brown scaled, posterior surfaces brown scaled with a longitudinal stripe of white scales, stripe dorsal on I and ventral on II, III with anterior and posterior surfaces brown scaled both with a ventral longitudinal white scaled stripe extending from base to near apex, II and III each with a few lateroapical white scales on anterior surface; tibiae I-III and tarsi I-III each dark brown scaled; posttarsi I-III (Fig. 7) each with 2 ungues, I and II each with ungues equal, each with a tooth, III with ungues equal, both simple. *Wing*. Dorsal and ventral veins with dark brown scales; alula with a few narrow brown scales on margin; upper calypter with several brown setae on margin; 2 remigial setae. *Halter*. Pedicel pale; capitellum with pale brown scales. *Abdomen*. Terga dark brown scaled, I-VI each with a large laterobasal patch of white scales (remainder of abdomen removed with genitalia); sterna each white scaled with an apical band of brown scales; terga and sterna with several brown setae, mostly along posterior margins. *Genitalia* (Fig. 7). Tergum VIII moderately pigmented, wide, base slightly concave, apex convex, a number of short and moderately long thin setae at apex and similar ones scattered over apical 0.36, basolateral seta present, covered with minute spicules, numerous broad scales covering apical 0.75, basal 0.45 retracted into segment VII, VIII-Te index 0.57, VIII-Te/IX-Te index 2.98; sternum VIII moderately pigmented, wide, base concave mesally, apex with a shallow median indentation with a small lobe on each side of midline, numerous moderately long setae apically, more numerous and slightly stouter on apical lobes, numerous short and a few moderately long setae scattered over apical 0.93, covered with minute spicules, numerous broad scales covering much of apical 0.8, apical intersegmental fold unpigmented, VIII-S index 0.65; tergum IX moderately pigmented, wide, short, base with median area concave, apical area straight, setae absent, covered with minute spicules, IX-Te index 0.32; insula unpigmented, short, covered with minute spicules, 5 small tuberculi, each with a tiny spicule; lower vaginal lip heavily pigmented, narrow, a few spicules on outer margin and on hinge area, with a small caudally projecting moderately pigmented median apodeme, lower vaginal sclerite composed of a pair of moderately long and moderately broad heavily pigmented plates covered with minute spicules and situated on median basal area of the vaginal floor; upper vaginal lip heavily pigmented, complex, wide, posterior margin formed into a large upright shield caudad of spermathecal eminence, posterolateral corners formed into sharply rounded lobes, upper vaginal sclerite heavily pigmented, extremely large and complex, base attached along entire lateral margin of upper vaginal lip, median lateral area formed into a large scoop-like structure, a second plate caudad and extends around the posterior of the spermathecal eminence, moderately to heavily pigmented and broad basally; spermathecal eminence heavily pigmented, large, deep in depth, U-shaped in dorsal outline, numerous long spiny excrescences attached over entire dorsal surface except the apex; spermathecal eminence, upper vaginal lip and upper vaginal sclerite cover nearly entire upper vaginal area with heavily pigmented structures; postgenital lobe short, narrow, apex with a moderately deep median indentation, 16 setae on each side of midline, completely covered with minute spicules, dorsal PGL index 1.0, ventral PGL index 1.12; peri-anal membrane with minute spicules; cercus triangular in shape, moderately long, broad at base, apex acute, completely covered with small spicules, dorsal surface with a number of moderately long and a few short setae scattered over apical 0.9, ventral surface with several short and moderately long setae on outer 0.5, 1-2 broad scales, cercus index 2.95, cercus/dorsal PGL index 3.02; 3 seminal capsules, 1 large, 1 medium and 1 small in size, heavily pigmented, spherical, several small seminal capsule pores near orifice, base of accessory gland duct unpigmented.

MALE, PUPA, LARVA AND EGG. Not known.

DISCUSSION. *Aedes comosus* is similar to *comatus* in both adult habitus and the female genitalia. It possesses the following combination of characters: antepronotum with 10-13 setae, propleuron with 23-25 setae and mesepimeron with 16 setae dorsad of scale patch which differs from *comatus* which has: antepronotum with 15-17 setae, propleuron with 20 setae and mesepimeron with 18-19 setae dorsad of scale patch.

The female genitalia of *comosus* differ from *comatus* in the shape or the lower vaginal sclerite, development of the spermathecal eminence and the number, position and development of the spiny excrescences on the spermathecal eminence.

TYPE-DATA. Holotype female (genitalia mounted on a slide in Canada balsam) with the following collection data: MALAYSIA, *Sabah,* Kota Belud, 6 April 1965, collection number 306, F. Y. Cheng collector, SEAMP accession number 35, genitalia preparation number T73.439. The holotype is deposited in the USNM and is in good condition.

DISTRIBUTION. Known only from the type-locality.

BIOLOGY. Not known.

AEDES (VERRALLINA) CONSONENSIS REINERT

(Figs. 28, 40, 51)

DISCUSSION. Sternum IX (Fig. 28) of the male genitalia has 17 short and moderately long setae on the median posterior area and several small scars basad of the setae. These scars are presumably from scales (which had been rubbed off) since several other species in Section B possess scales on this area.

The larvae of *consonensis* are somewhat aberrant from the other members of Section B in having most setae with more branches. Antennal seta 2-A has a subapical constriction (Fig. 51). Larval seta 18-C (see Hochman and Reinert 1974) is small and single.

Pupae (Fig. 40) of this species are normal for Section B.

Aedes consonensis is described and compared to the other members of Section B by Reinert (1973b).

AEDES (VERRALLINA) CRETATUS DELFINADO

(Figs. 23, 58)

DISCUSSION. Additional information taken from the collection data sheet of the holotype is given in the type-data section below.

Biology and distribution data for *cretatus* are presented. The specimens from Malaysia represent a new record for this country.

Tergum IX of the female genitalia (Fig. 23) and tarsomeres 5 and posttarsi of the male (Fig. 58) are illustrated for the first time.

TYPE-DATA. The collection data sheet for the holotype male of *cretatus* contains the following information: THAILAND, *Khon Kaen,* Tham Pholi Yan, 26 November 1962, Sahem Esah collector, resting in heavy forest vegetation, collection number T-1822-5. The label on the holotype specimen, however, has printed Tham Pho Thi Yan as the collection locality. Neither spelling of the locality could be found in the gazetteer to Thailand.

DISTRIBUTION. 71 specimens examined: 20♀, 16♂, 3 p, 9 L, 13 with associated skins (3 p, 10 l).

CAMBODIA. *Kompong Speu,* Kirirom; 1♀, 2♂.

MALAYSIA. *Selangor,* Ulu Gombak; 5♀ pl, 4♂ pl, 3♂, 5 L.

THAILAND. *Chiang Mai,* Amphoe Muang, Huey Chang Kien; 1♀ (paratype). *Chon Buri,* Khao Mai Keo; 1♂. *Khon Kaen,* Tham Pholi Yan; 1♂ (holotype), 1♂ (paratype). *Lampang,* Ban Pa Khoi, Ban Pha Dang, Ban Rai Na Dieo; 1♂ (paratype), 2♀ p, 4♀, 2♂, 1 p. *Nakhon Nayok,* Kaeng Saquan area, Sarica Village, Khao Yai; 2♀, 1 p, 4 L. *Nakhon Ratchasima,* Amphoe Pak Chong, Khao Tha Kor, Khao Yai, Lam Nam Tha (along klong); 1♀ (allotype), 1♀ and 1♂ (paratypes). *Tak,* Khao Salak Phra; 1♀ p and 1♀ (paratypes), 1♀ pl, 1 p.

All the above specimens are in the USNM.

BIOLOGY. Immatures in Thailand were collected from a small flood pool, a small and a large pool in a dry stream bed, and on the margin of a stream; from clear, fresh, unmoving, temporary water in partially shaded areas located in secondary deciduous forests (3 times) and a primary rain forest (once) in mountainous terrain; and at elevations from 280-700 m. In Malaysia immatures were collected from a small ground pool containing colored, fresh, unmoving, temporary water in a partially shaded area located in a secondary rain forest in mountainous terrain and at an elevation of 152 m.

Adult females in Thailand have been collected biting man in forested areas at the following times 0900-1000, 1500-1630 and 1800-1900 hours and males have been found resting in forest vegetation.

AEDES (VERRALLINA) CYRTOLABIS EDWARDS

(Figs. 41, 52, 58)

FEMALE. The following characters are given to supplement the description of the female by Klein (1973: 3). *Thorax.* Following setae present: 4-5 median anterior promontory; numerous acrostichal (anterior and posterior); numerous dorsocentral (anterior and posterior); scutal fossal (3-5 anterior, 3-6 lateral and 1 posterior); numerous supra-alar; 5-6 posterior medial scutal; 1 postalar callar; and scutellar (4-6 long and 4-6 short ones on lateral lobe, 4-6 long and 4-5 short ones on median lobe); 11-15 antepronotal; 4-6 postpronotal; 15-18 propleural; 4-7 postspiracular; mesepimeron with 4-6 upper and 11-18 posterior, lower ones shorter; 13-22 on prealar knob; mesepimeron with 16-24 dorsad of scale patch; prosternum, subspiracular area, paratergite, mesomeron and metameron bare.

PUPA (Fig. 41). Chaetotaxy based on a single skin with associated adult. *Cephalothorax.* Setae 1, 2-CT double or triple; 3-CT single or double; 4-CT with 7 branches; 5, 7-CT with 7 or 9 branches; 6-CT double; 8-CT with 10-11 branches; 9-CT triple or 4 branched. *Respiratory trumpet.* Moderately pigmented; index 3.30. *Metanotal plate.* Seta 10-CT with 6 branches; 11-CT single; 12-CT with 5-6 branches. *Abdomen.* Setae 0-II, VII, VIII single; 0-III-VI double; 1-I with 13-16 branches on basal third; 1-II triple; 1-III with 8 branches; 1-IV with 7 branches; 1-V with 6-7 branches; 1-VI with 7-8 branches; 1-VII with 5 branches; 2-I-VII single and stout; 3-I with 7 branches; 3-II, III single; 3-IV with 7-8 branches; 3-V with 5-6 branches; 3-VI with 5 branches; 3-VII with 5 or 8 branches; 4-I with 7-8 branches; 4-II, VI with 6-7 branches; 4-III with 6 branches; 4-IV triple or 5 branched; 4-V with 6 or 8 branches; 4-VII with 5 branches; 5-I, VII with 5 branches; 5-II with 7-8 branches; 5-III with 6-8 branches; 5-IV-VI double; 6-I triple; 6-II single; 6-III, VII with 6 branches; 6-IV, VI with 4 branches; 6-V with 5 branches; 7-I with 6 branches; 7-II triple or 6 branched; 7-III, IV with 5 branches; 7-V with 8 or 10 branches; 7-VI triple; 7-VII double; 8-III, IV triple or 4 branched; 8-V, VI with 4 branches; 8-VII with 4 or 6 branches; 9-I, VIII single or double; 9-II-VI single; 9-VII double; 10-I single; 10-II, VI double; 10-III with 5-6 branches; 10-IV with 6 branches; 10-V, VII with 4 branches; 11-I, III-VI single; 11-II double; 11-VII double or triple; 14-III-VI single; 14-VII, VIII single or double. *Paddle.* Ovoid; small serrations on distal portion of basal 0.66 of outer margin, minute proximally and larger distally; tiny spicules on apical 0.34 of outer and apical 0.28 of inner margins; midrib reaches apex; seta 1-P single; index 1.63.

LARVA (Fig. 52). Chaetotaxy as figured and recorded in Table 18. Description based on one skin with associated adult from Sabah and 5 badly damaged skins from Singapore (description by Edwards and Given, 1928, was based on the latter 5 specimens). *Head.* Seta 4-C with 4-8 branches; 5-C double to 5 branched; 6-C double or triple; 7-C with 7-14 branches; 12-C with 4-8 branches; dorsomentum with 36-37 teeth. *Antenna.* Moderately long, moderately pigmented, with several scattered small spicules, more numerous on basal area; seta 1-A with 4-6 branches, moderately long, branches somewhat thickened; 2-A long, with a subapical constriction; 3-A short, 0.19-0.28 length of 2-A; 4-A moderately long, 0.38-0.52 length of 2-A; 6-A short, 0.24-0.33 length of 2-A. *Abdomen.* Seta 1-VIII with 6-9 branches; 3-VIII with 7-11 branches; 5-VIII with 8-13 branches; 2-X with 6-8 branches; ventral brush with 10 setae on grid and 1-2 precratal shorter ones, all multiple branched; saddle moderately pigmented, incompletely rings segment X, acus absent; 4 moderately long to long anal papillae; comb with 8-12 (usually 10) scales arranged in a single curved irregular row, each scale with a stout median apical spine and small denticles on laterobasal areas. *Siphon.* Moderately pigmented; acus well developed; index 1.83-2.30, average 2.14; pecten on basal 0.55-0.57 of siphon, composed of 11-13 (usually 12) teeth, apical 2-4 teeth wider spaced than remainder of teeth, apical 6-9 teeth long and slender, each tooth with 1-2 small stout ventral denticles near base; seta 1-S short, 5-8 branched, base attached on basal 0.64-0.65 of siphon distad of last pecten tooth.

DISCUSSION. The above is the first description and illustration of the pupal stage of *cyrtolabis*. The description and illustration given for this species by Delfinado (1967) are of a *Finlaya*, probably a species in the *niveus* Group. Pupal skin NY57-102, described and illustrated by Delfinado (1967: 17, Fig. 7) for *cyrtolabis*, does not belong to the adult male even though the adult and slide labels bear the same collection number and information. The following data were used in determining the above error: adult specimen of *cyrtolabis* from Thailand is a male but the pupal skin is from a female; data sheet and rearing record for collection NY57 indicates 4 species were associated in this collection--*Culex* (*Lophoceraomyia*) species (one male with pupal and larval skins), *Aedes* (*Finlaya*) species (probably *prominens*; 2 males with pupal skins, one male with larval skin), *Aedes* (*Finlaya*) *niveus* Group (one female with pupal skin) and *Aedes* (*Aedes*) probably new species (one male with pupal skin) [adult is *cyrtolabis*]; pupal skin NY57-102 fits well with members of the *niveus* Group of *Finlaya*, however, it is atypical of other species of *Verrallina*, especially in the development of setae 3-C, 9-VII and VIII and the respiratory trumpet; pupal skin NY57-102 differs significantly from the associated pupal skin of the female of *cyrtolabis* from Sabah which also has an associated larval skin which compares very well with the larval skins from Singapore; and the immature habitat of this collection (NY57) was water in a treehole which is characteristic of *Finlaya* but quite different from the ground pool inhabiting *Verrallina*. From the above information I believe the pupal skin (NY57-102) belongs to a species in the *Aedes* (*Finlaya*) *niveus* Group and was mistakenly labeled with the same number as the adult male of *cyrtolabis*.

The larva is redescribed from a skin (with an associated pupal skin and adult) collected in Malaysia and 5 larval skins from Singapore. The description and illustration of *cyrtolabis* by Edward and Given (1928: 344-345) were sketchy and incomplete. The larva was therefore illustrated and completely described here.

The adult habitus and male and female genitalia of *cyrtolabis* indicate the species belongs to the *uncus* Group of species. Tarsomeres 5 and posttarsi of the male are illustrated (Fig. 58) for the first time.

DISTRIBUTION. 29 specimens examined: 11♀, 11♂, 5 l, 1 with associated pupal and larval skins.

CAMBODIA. *Kompong Sela*, Phnom Praung; 6♀, 7♂. *Kompong Som*, Tuk Sap; 3♀, 2♂.

MALAYSIA. *Sabah*, Beaufort, Sipitang; 1♀ pl, 1♀, 1♂.

SINGAPORE. 5 l.

THAILAND. *Nakhon Nayok*, Amphoe Muang, Khao Yai; 1♂.

BIOLOGY. The larva from Malaysia was collected from a small, heavily shaded ditch containing fresh, clear, temporary, unmoving water located in a secondary rain forest and at an elevation of 15 m.

AEDES (VERRALLINA) DUX DYAR AND SHANNON

(Figs. 23, 51, 58, 60)

EGG (Fig. 51). *Shape*. Fusiform; both anterior and posterior ends with a gradual taper, the latter more acute; greatest diameter near middle. *Size*. Length 637-730 microns; width at widest point 154-179 microns. *Color*. Dark brown. *Chorion*. Cleared chorion viewed with transmitted light shows a reticulation composed of polygonal and irregular sided cells with cell walls raised; surface sculpturing well defined on ends and faint on middle 0. 5.

DISCUSSION. Mattingly (1956: 795) reported the *Aedes* sp. ? No. 50 of Borel (1930: 287) appeared to be *Aedes dux*. After examining a number of specimens of *dux* from Saigon and comparing them with the description and illustrations of Borel's *Aedes* sp. ? No. 50, I am confident Mattingly's appraisal of this species was correct.

The following structures of *dux* are illustrated for the first time: male posttarsi (Fig. 58), female posttarsi (Fig. 60), tergum IX of the female genitalia (Fig. 23).

The eggs of *dux*, previously undescribed, resemble those of the other described species of *Verrallina*. This description is based on 9 mature eggs extracted from the abdomen of a specimen in the USNM which possesses the following collection data on the labels: PHILIPPINE ISLANDS, *Luzon Island*, *Rizal*, Camp Nichols, 3 July 1923, Pvt. Carraway collector, genitalia preparation number T73.231. Nomencalture used in the description follows Kalpage and Brust (1958) and the chorion preparation method used is that of Craig (1955).

Additional information on *dux* is included in the discussion section of *butleri*.

DISTRIBUTION. 322 specimens examined: 228♀, 41♂, 3 L, 17 l, 9 E, 15 with associated skins (6 p, 9 l).

INDONESIA. *Java*, Angke, Kopetakan, Semarang, Tjilintjing; 15♀, 3♂.

MALAYSIA. *Perlis*, Kg. Sangei Padang, Kg. Sungai Bhorn; 3♀ pl, 3♀ p, 2♀, 1♂ pl.

PHILIPPINES. *Leyte Island*, Dulag, Palo; 2♀, 1♂. *Luzon Island, Manila*, Manila; 32♀, 1♂. *Pampanga*, Camp Stotsenberg; 50♀. *Pangasinan*, San Fabian; 5♀, 8♂. *Rizal*, Camp Nichols; 37♀, 2♂, 9 E. *Zambales*, Subic Bay; 1♀ pl, 9♀, 5♂, 2 L, 17 l. *Mindanao Island, Zamboanga*, Zamboanga City; 2♀, 2♂. *Mindoro Island*, Caminawit Point; 1♀, 1♂. *Samar Island*, San Antonio; 1♀. Philippine Islands, no locality given; 10♀.

SOUTH VIETNAM. *Binh Dinh*, Qui Nhon; 4♀. *Gia Dinh*, Khanh Hoi (Saigon Port), Saigon, Tan Son Nhut (U. S. Army Tent Camps Alpha and Bravo); 2♀ pl, 32♀, 2♂ pl, 10♂, 1 L. *Khanh Hoa*, Cam Ranh, Nha Trang; 2♀, 1♂. *Phong Dinh*, Can Tho; 1♀. *Thua Thien*, Phu Bai; 1♀.

THAILAND. *Chanthaburi*, Wat Khao Phloi Waen; 1♀. *Phra Nakhon*, Bangkok; 8♀, 3♂. *Samut Prakan*; 2♀ p, 1♂ p. *Songkhla*; 1♀. Thailand, no locality given; 1♀.

BIOLOGY. In Malaysia immatures were collected from small animal hoofprints near the coast, buffalo hoofprints and ground pools containing colored or clear, fresh, unmoving, temporary water in unshaded areas located in and near villages.

Immatures were collected from ground pools (Thailand), footprint in ricefield, buffalo wallow, duckweed pool (Philippines), marshy depressions, wheel track, footprints and ground pools (South Vietnam).

Adults were taken in light traps in South Vietnam.

AEDES (VERRALLINA) EMBIENSIS HUANG
(Fig. 58)

DISCUSSION. Upon examining the holotype male of *embiensis* I found posttarsi I and II with ungues unequal in size, each with a tooth and III with ungues equal in size, both simple (Fig. 58), which differs from Huang (1968: 25) who reported only the larger ungues of I and II as bearing teeth. The basal mesal lobe of the genitalia possessed 7 (9 on other side) moderately long setae on apical area and 11 (10 on other side) short setae on basal portion which also differs from Huang who recorded 9 setae on the mesal lobe (apical area of basal mesal lobe). These features are like *carmenti* and when the genitalia of *embiensis* were compared to the former species no consistant differences could be found. The adults of these 2 species are also very similar in habitus, however, *embiensis* differs by possessing poorly developed white scaled dorsal bands on abdominal terga III-V and a few more hairs ventrad of scale patch of mesepimeron.

Several features indicate *embiensis* and *carmenti* may be conspecific, some of which are: no apparent differences between the male genitalia; male posttarsi are identical; adults are very similar in habitus, except abdominal banding; tergal abdominal scaling variable in other species of the subgenus; and type-locality of *embiensis* is within the geographical range of *carmenti*. The exact taxonomic status of *embiensis*, however, I feel should await the collection of progeny reared specimens, both male and female, with associated immature skins from the type-locality.

AEDES (VERRALLINA) FRAGILIS (LEICESTER)

(Figs. 21, 29)

The following information supplements the descriptions of Leicester (1908: 198), Delfinado (1968: 15) and Klein (1973: 5).

FEMALE. Based on the holotype of *malayi* and females from Cambodia and Malaysia. *Head.* Antenna 1.22-1.26 length of proboscis; maxillary palpus 0.17-0.18 length of proboscis; proboscis 0.96-0.98 length of femur I; eyes separated in front with broad white scales on interocular space. *Thorax.* Following setae present: 2 median anterior promontory; numerous acrostichal (anterior and posterior); numerous dorsocentral (anterior and posterior); scutal fossal (3 anterior and 3-4 lateral); numerous supra-alar; 4 posterior medial scutal; 1 postalar callar; scutellar (3 long and 2-3 short ones on lateral lobe, 4 long and 3 short ones on median lobe); 7-10 antepronotal; 3-4 postpronotal; 7-8 propleural; 2-4 postspiracular; 3-4 upper and 7-8 posterior mesepisternal; 5-6 on prealar knob; and mesepimeron with 5-6 dorsad of scale patch. Prosternum, subspiracular area, paratergite, mesomeron and metameron bare. *Wing.* Remigium with 1 seta. *Halter.* Pedicel pale; capitellum brown scaled. *Genitalia* (Fig. 21). As illustrated.

MALE. Based on the lectotype of *fragilis*. *Head.* Antenna plumose, 1.09 length of proboscis; maxillary palpus short, 0.09 length of proboscis; eyes separated in front. *Thorax.* Following setae present: 2 median anterior promontory; numerous acrostichal (anterior and posterior); numerous dorsocentral (anterior and posterior); scutal fossal (2-3 anterior and 3 lateral); numerous supra-alar; 4 posterior medial scutal; 1 postalar callar; scutellar (4 long ones on lateral and median lobes, based on size of setal bases); 7-8 antepronotal; 2 postpronotal; 5-6 propleural; 2 postspiracular; and mesepimeron with 5 dorsad of scale patch. Prosternum, subspiracular area, paratergite, mesomeron and metameron bare. *Wing.* Remigium with 1 seta. *Genitalia* (Fig. 29). Phallosome complex, opisthophallus consists of a moderately pigmented tergal transverse bridge between parameral apodemes, median caudal margin produced into a long broad tapering lobe with apex sharply pointed and extends caudad to near apices of prosophallic arms, a small pointed tongue-like lobe situated on tergal surface near middle and projected caudally; sternum IX with 9-10 setae and 5-6 broad scales near center; remainder of genitalia as in the illustration.

DISCUSSION. The holotype male genitalia of *fragilis* are completely illustrated showing the complex arrangement of the phallosome. Edwards (1917: 222) partially illustrated the male genitalia of this species for the first time but did not show the basal mesal lobe and only drew part of the phallosome. Delfinado (1968: Fig. 8) redrew Edward's illustration.

The inclusion of *malayi* as a synonym of *fragilis* by Delfinado (1968: 15) appears to be correct but final determination should await reared specimens of both sexes with associated immature skins or sibling reared males and females.

Male adult habitus features of *fragilis* are similar to those of *consonensis* (see Reinert 1973b) but these 2 species can be separated as follows--*fragilis* possesses: antenna 1.09 length of proboscis; maxillary palpus 0.09 length of proboscis; postpronotum with 2 posterior setae; and mesepimeron with 5 setae dorsad of scale patch, while *consonensis* possesses: antenna 0.82 length of proboscis; maxillary palpus 0.15 length of proboscis; postpronotum with 5 posterior setae; and mesepimeron with 11 setae dorsad of scale patch.

TYPE-DATA. The holotype female of *malayi* in the BMNH possesses the following label information in addition to that listed by Delfinado (1968: 16): 20/12/03, Mosq. 53, Dr. G. F. Leicester, 1912-350. I remounted the genitalia in Canada balsam and gave the slide preparation number T73.556.

The holotype of *malayi* is in fair condition and is as follows: scutum partially rubbed; right legs I and II and tarsomeres 2-5 of III missing; and right wing missing. The genitalia are in good condition and mounted on a microscope slide.

The male lectotype of *fragilis* is in poor condition and is as follows: left antenna and left palpus missing; pleural areas rubbed; all legs except right femur and tibia of III missing (parts of 2 legs mounted on slide with genitalia); left wing missing; and abdominal terga II-V not attached to specimen but glued to the paper stage attached to the pin. Male genitalia were dissected, mounted in Canada balsam on a microscope slide and are in good condition.

DISTRIBUTION. 4 specimens examined: 3♀, 1♂.

CAMBODIA. *Kompong Som*, Tuk Sap; 1♀.

MALAYSIA. *Johore*, Panti Forest Reserve; 1♀. *Selangor*, Kuala Lumpur; 1♀ (holotype of *malayi*), 1♂ (lectotype of *fragilis*).

BIOLOGY. One female from Johore, Malaysia was collected from a biting collection on a clear day in a partially shaded area of a secondary rain forest in hilly terrain, on 5 September 1969 at 1300 hours and at an elevation of 76 m.

AEDES (VERRALLINA) GIBBOSUS DELFINADO

(Figs. 25, 53, 58)

PUPA. The pupa is completely described here since the original description was incomplete and based on a single specimen. Chaetotaxy as recorded in Table 6. *Respiratory trumpet*. Moderately pigmented; index 3.18-5.00, average 4.26. *Metanotal plate*. Lateral portion heavily pigmented. *Abdomen*. Setae 6, 9-VII weakly developed; 4-VIII double or triple; 9-VIII single. *Paddle*. Ovoid; minute serrations on distal portion of basal 0.63 of outer margin; minute spicules on apical 0.37 of outer and apical 0.27 of inner margins; midrib does not reach apex; seta 1-P moderately long, single; index 1.3-1.7, average 1.51.

LARVA (Fig. 53). Chaetotaxy as figured and recorded in Table 19. *Head*. Seta 4-C with 5-10 branches; 5-C triple to 6 branched; 6-C triple to 5 branched; 7-C with 9-15 branches; 12-C with 6-8 branches; dorsomentum with 35-40 teeth. *Antenna*. Moderately long, lightly to moderately pigmented, with several small scattered spicules; seta 1-A triple to 5 branched, moderately long; 2-A long, with a subapical constriction; 3-A short, 0.26-0.36 length of 2-A; 4-A moderately long, 0.51-0.70 length of 2-A; 6-A short, 0.29-0.38 length of 2-A. *Abdomen*. Seta 1-VIII with 5-10 branches; 3, 5-VIII with 6-11 branches; 2-X with 6-10 branches; ventral brush with 10 setae on grid and 2 precratal shorter ones, all multiple branched; saddle moderately pigmented, incompletely rings segment X, acus absent; 4 moderately long anal papillae; comb with 7-12 (usually 10) scales arranged in a single curved row, each scale with a stout median apical spine and small denticles on laterobasal areas. *Siphon*. Moderately pigmented; acus well developed; index 2.36-3.16, average 2.88; pecten on basal 0.49-0.53 of siphon, composed of 9-12 (usually 10) teeth, apical 2-3 teeth longer, smooth and wider spaced than remainder each of which has a small stout ventral denticle near base; seta 1-S short, double or 4 branched, base attached on basal 0.63-0.66 of siphon distad of last pecten tooth.

DISCUSSION. The holotype data are amended as follows (information from collection data sheet and specimen label): holotype male (genitalia mounted on slide) with associated pupal skin, THAILAND, *Songkhla*, Amphoe Haad Yai, near Ton Nga Chang Waterfalls, 6 km from weather station to the main road, 27 May 1965, collection number SL-87-138, USNM type No. 69211, Kol Mongkolpanya collector, pupal slide preparation number 18148, collected as a pupa from a large (8 feet x 30 feet) pool in a dry stream bed, water containing numerous leaves and sticks with moderate shade from bamboo. Holotype desposited in the USNM.

The present description and illustration are the first of the fourth stage larva of this species and are based on 4 reared specimens with associated skins. Tarsomeres 5 and posttarsi of the male are also illustrated for the first time (Fig. 58).

Female genitalia of *gibbosus* are very distinctive, especially in the development of the lower vaginal sclerite and the shape and presence of several setae on tergum IX (Fig. 25).

Adults of *gibbosus* are easily recognized by the presence of fine hairs and scales on the metameron. Other species with this feature and occuring within the distribution range of *gibbosus* are members of the *andamanensis* Group, however, these species also possess scales on the antepronotum and postspiracular area and setae on the median dorsal area of the prosternum.

DISTRIBUTION. 77 specimens examined: 22♀, 14♂, 4 L, 24 with associated skins (10 p, 13 l, 1 l incomplete).

INDONESIA. *Java*, Pagar Dewa; 1♀ genitalia (mounted on slide) paratype.

MALAYSIA. *Negeri Sembilan*, Ulu Serting Forest Reserve; 1♀ pl. *Perak*, Choir Big Game Forest Reserve; 1♀ pl, 4♀ p, 3♀, 5♂ p. *Sabah*, Beaufort, Kudat, Tenom, Mandalom Forest Reserve, Sipitang Forest Reserve, Keningau, Tuaran; 4♀ pl, 5♀, 4♂ pl, 2♂, 4 L. *Selangor*, Rantaw Panjang; 1♀ genitalia (mounted on slide) paratype.

THAILAND. *Krabi*, Ban Phru Toei; 1♂ pl. *Phangnga*, Khao Sung; 1♀ pl, 1♂ l. *Songkhla*, Amphoe Haad Yai, near Ton Nga Chang Waterfalls; 1♀ pl, 1♂ p (holotype).

BIOLOGY. In Thailand immatures were collected from large stream pools in dry stream beds (filled with rain water) and a swampy area; from clear or turbid, fresh, unmoving, temporary water in moderately shaded areas located in a secondary rain forest, a bamboo grove and a secondary scrub area; and once at an elevation of 80 m.

Immatures in Malaysia were collected from small and large flood and ground pools and a large swampy area; from clear, fresh, unmoving, temporary water in moderately and heavily shaded areas located in secondary rain forests; and at elevations from 30-260 m. One female was taken in a biting collection.

AEDES (VERRALLINA) HAMISTYLUS LAFFOON
(Figs. 21, 58, 60)

DISCUSSION. The female posttarsi and tarsomeres 5 (Fig. 60) and tergum IX (Fig. 21) are illustrated for the first time. Male posttarsi and tarsomeres 5 are shown in Figure 58.

DISTRIBUTION. 71 specimens examined: 49♀, 17♂, 5 L.

MALAYSIA. *Sabah*, Lahan Datu, Kg. Bukit Blachan; 1♀.

PHILIPPINES. *Balabac Island*, Cape Melville; 46♀, 12♂ and 5 L (paratypes), 1♂ (holotype). *Mindoro,* San Jose; 2♀ and 4♂ (paratypes).

BIOLOGY. One female from Malaysia was collected from a biting collection on a clear day, in a partially shaded area of a secondary rain forest, on 20 May 1970 at 1440 hours and at an elevation of 30 m.

AEDES (VERRALLINA) HARRISONICUS NEW SPECIES

(Fig. 8)

FEMALE. *Head.* Antenna dark brown, 0.97-0.98 length of proboscis, pedicel brown with a few small dark scales and short fine brown hairs mesally, flagellomere 1 with basal 0.55 pale and with a few small dark scales; clypeus dark brown, bare; maxillary palpus dark brown scaled, 4 segmented, 0.15-0.17 length of proboscis; proboscis dark brown scaled, 1.02-1.10 length of femur I; eyes contiguous; ocular setae dark brown; scales on head broad, dark brown and decumbent except for narrow curved golden scales along coronal suture and a few on ocular line which become more numerous mesally, a stripe of broad white scales on lateral surface extending from area in front of antepronotum to ocular line and postgena with similar scales; occiput with a number of short brown erect forked scales and a few decumbent broad white scales. *Thorax.* Scutal integument dark reddish-brown; scutum covered with narrow curved reddish-brown scales except for a few narrow curved golden scales on median anterior promontory area, anterior scutal fossal area and supra-alar area; scutellum with narrow curved reddish-brown scales on each lobe; dark brown setae on the following areas: 3-4 median anterior promontory, numerous acrostichals (anterior and posterior), numerous dorsocentrals (anterior and posterior), scutal fossal (3-5 anterior, 5-7 lateral and 2 posterior), numerous supra-alar, 5-6 posterior medial scutal, 1 postalar callar and scutellar (5-6 long and 3-4 short ones on lateral lobe, 5-7 long and 4-6 short ones on median lobe); pleural integument dark reddish-brown; antepronotum without scales, 9-13 dark setae; postpronotum with narrow curved reddish-brown scales dorsally, 5-6 posterior brown setae; propleuron with a patch of broad white scales, 15-18 brown setae; prosternum, subspiracular area, paratergite, mesomeron and metameron bare; postspiracular area without scales, 5-7 brown setae; mesepisternum with an upper and a lower patch of broad white (with a brownish tinge) scales, 4-5 upper and 10-16 posterior setae, lower ones shorter, a few short fine golden hairs on anterodorsal area; prealar knob without scales, 9-15 brown setae; mesepimeron with a patch of broad white scales near center, 19-33 golden-brown setae dorsad of scale patch, numerous long golden hairs caudad of scale patch and extending below it to near lower margin of sclerite. *Legs.* Coxae I-III each with several brown setae, I with broad brown scales and a small dorsal patch of white ones on anterior surface, II and III each with a patch of broad white scales on anterior surface; trochanters I-III each with a few broad white scales; femora I and II each with anterior surface brown scaled, posterior surface brown scaled with a longitundinal white scaled stripe from base to near apex, stripe dorsal on I and ventral on II, III with anterior and posterior surfaces mostly white scaled and with a dorsal brown scaled longitudinal stripe from base to apex, forming a narrow apical brown band; tibiae I-III and tarsi I-III brown scaled; posttarsi I-III each with 2 ungues, I and II with ungues equal, each with a tooth, III with ungues equal, both simple. *Wing.* Dorsal and ventral veins with brown scales; alula with several moderately broad brown scales on margin; upper calypter with several brown setae on margin; 1-2 brown remigial setae.

Halter. Pedicel pale; capitellum creamy-white scaled. *Abdomen*. Terga brown scaled with a laterobasal white scaled patch on I-VII; sterna creamy-white scaled with a few pale brown scales apically; terga and sterna with numerous golden setae, mostly along posterior margins. *Genitalia* (Fig. 8). Tergum VIII lightly to moderately pigmented, very wide, base very slightly concave, apex gently convex, a number of short and moderately long setae on apical 0.28-0.43, several along apical margin long, numerous broad scales covering apical 0.63-0.68, basolateral seta present, basal 0.35-0.40 retracted into segment VII, VIII-Te index 0.35-0.42, VIII-Te/IX-Te index 1.67-2.27; sternum VIII lightly to moderately pigmented, wide, base nearly straight, apex with a small median indentation with a small lobe on each side of midline, numerous moderately long setae apically, numerous short and a few moderately long setae scattered over apical 0.92-0.94, numerous broad scales covering most of area, apical intersegmental fold unpigmented, VIII-S index 0.59-0.63; tergum IX lightly pigmented with a triangular moderately pigmented plate on each side of midline, wide, setae absent, covered with minute spicules, IX-Te index 0.43-0.49; insula unpigmented, short, covered with minute spicules, 4-5 tiny tuberculi, each with a small spicule; lower vaginal lip heavily pigmented, median area narrow, lateral areas wide and wrinkled, basal area bulbous and wrinkled, lower vaginal sclerite composed of a large median heavily pigmented wrinkled plate which is incompletely divided along most of midline except basal portion; upper vaginal lip heavily pigmented, wide throughout, forming nearly right angles at posterolateral margin, developed into a broad shield caudad of spermathecal eminence, upper vaginal sclerite heavily pigmented, large, extending mesad from lateral portions of vaginal lip and covering much of the vaginal roof; spermathecal eminence heavily pigmented, large, dorsal surface with a long basal extension covered with closely matted, moderately long, branched spiny excrescences, ventral outline heart-shaped; postgenital lobe short, moderately broad, apex with a small median indentation, 21-29 setae on each side of midline, completely covered with minute spicules, dorsal PGL index 0.47-0.68, ventral PGL index 0.70-0.79; perianal membrane with minute spicules; cercus triangular in shape, moderately long, broad at base, apex acute, completely covered with minute spicules, dorsal surface with numerous short and moderately long setae over apical 0.90-0.94, a few long setae at apex, 0-3 broad scales, ventral surface with short and moderately long setae on outer margin and becoming more numerous apically, cercus index 2.00-2.42, cercus/dorsal PGL index 3.25-4.48; 3 seminal capsules, 1 large, 1 medium and 1 small in size, heavily pigmented, ovoid, each with several small seminal capsule pores near orifice, base of accessory gland duct unpigmented.

MALE, PUPA, LARVA AND EGG. Not known.

DISCUSSION. There appears to be no consistant differences between the adult habitus of *harrisonicus* and the other members of the *uncus* Group.

Female genitalia of *harrisonicus* are similar to the other members of the *uncus* Group but can easily be separated from them by the development of the lower and upper vaginal lips, shape of the area covered with spiny excrescences of the spermathecal eminence, and development of the lower vaginal sclerite.

There is a possibility that *harrisonicus* may be the female of one of the previously described members of the *uncus* Group for which only the male is known, however, it is impossible at present to assign it to an existing species because the adults of the group exhibit no noticeable differences and the immatures of the new species are unknown. Since *harrisonicus* is separated geographically from the species with unknown females (*nubicolus, protuberans* and *torosus*) it is best at present to describe it as new.

This species is dedicated to Bruce A. Harrison, Department of Entomology, Walter Reed Army Institute of Research, Washington, D. C., in recognition of his work on mosquitoes in Southeast Asia.

TYPE-DATA. Holotype female, INDONESIA, *Java*, Megamendg Mts., 10 January 1909, Bryant and Palmer collectors, genitalia preparation number T73.388; 7 female paratypes, genitalia preparation numbers T73.400, T73.401, T73.402, T73.568, T73.569, 46-II-14a (no adult), 46-III-10e, each with the following label data, INDONESIA, *Java*, Mt. Gede, 1909, Bryant and Palmer collectors. The holotype and 6 paratypes are deposited in the USNM, and one paratype will be deposited in the BMNH.

The holotype is in good condition, though somewhat rubbed, and all paratypes are moderately to heavily rubbed, most also with several legs missing.

DISTRIBUTION. Known only from localities mentioned in type-data.

BIOLOGY. Nothing is known about the biology of this species.

AEDES (VERRALLINA) INCERTUS EDWARDS

(Figs. 9, 25)

Aioretomyia Taeniata Leicester 1908, Culicidae Malaya 3: 190 (♀) (Name preoccupied).

Aedes(*Aedes*) *incertus* Edwards 1922a, Indian J. Med. Res. 10: 268 (*nom. nov.* for *Taeniata* Leicester 1908, *non* Wiedemann 1828).

Aedes (*Aedes*) *dermajoensis* Brug 1831, Tijdschr. Entomol. 74: 250 (♂*). NEW SYNONYM.

FEMALE. *Head*. Antenna dark brown, 1.02-1.10 length of proboscis, pedicel light brown with a few small brown scales and short fine brown hairs mesally, flagellomere 1 with basal 0.4 pale and with several small brown scales; clypeus dark brown, bare; maxillary palpus blackish-brown scaled, 0.14-0.15 length of proboscis; proboscis blackish-brown scaled, 1.06-1.12 length of femur I; eyes contiguous; ocular setae dark brown and well developed; scales on head broad, dark brown and decumbent except for narrow curved golden-brown scales along coronal suture and a few on ocular line which become more numerous mesally, a stripe of broad white scales on lateral surface extending from area in front of antepronotum to ocular line and postgena with similar scales; occiput with a number of short brown erect forked scales and a few decumbent broad white scales. *Thorax*. Scutal integument reddish-brown; scutum covered with narrow curved reddish-black scales except for narrow curved golden-white scales forming small patches (occasionally only a few golden-white scales) on median anterior promontory area, anterior scutal fossal area, supra-alar area and a few on basal area of median lobe of scutellum; scutellum with pale brown to golden narrow curved scales on each lobe; dark brown setae on following areas: 3 median anterior promontory, numerous acrostichals (anterior and posterior), numerous dorsocentrals (anterior and posterior), scutal fossal (3-6 anterior, 2-3 lateral and 1-2 posterior), numerous supra-alar, 6 posterior medial scutal, 1 postalar callar and scutellar (3-4 long and 2-4 short ones on lateral lobe, 5-6 long and 3-5 short ones on median lobe); pleural integument reddish-brown; antepronotum without scales, 8-13 brown setae; postpronotum with narrow curved reddish-black scales on upper area, 3-5 posterior brown setae; propleuron with a patch of broad white scales, 12-18 brown setae; prosternum, subspiracular area, paratergite, mesomeron and metameron bare; postspiracular area without scales, 2-4 brown setae; mesepisternum with an upper and a lower patch of broad white scales, 3-6 upper and 10-16 posterior brown setae, lower ones shorter and golden, a few short fine golden hairs on anterodorsal area; prealar knob without scales, 6-9 brown setae; mesepimeron with a patch of broad white scales near center, 10-17 golden setae dorsad of scale patch, several short fine golden hairs along posterior margin and posteroventral corner of scale patch. *Legs*. Coxae I-III each with several brown setae, I with broad brown scales and a small dorsal and ventral patch of broad white scales on anterior surface, II and III each with a patch of broad white scales on anterior surface; trochanters I-III each with a few white and pale brown scales; femora I and II each with anterior surface brown scaled, posterior surface brown scaled with a longitudinal white scaled stripe from base to near apex, stripe dorsal on I and ventral on II, III with anterior and posterior surfaces mostly white scaled and with a dorsal brown scaled longitudinal stripe from base to apex, forming a narrow apical brown scaled band, II and III each with a few anterior apical pale scales; tibiae I-III brown scaled, I and II each with a posterior longitudinal white scaled stripe, indistinct on I; tarsi I-III each brown scaled; posttarsi I-III each with 2 ungues, I and II with ungues equal, each with a tooth, III with ungues equal, both simple. *Wing*. Dorsal and ventral veins with brown scales; alula with several narrow brown scales on margin; upper calypter with several brown setae on margin; 1-2 brown remigial setae. *Halter*. Pedicel pale; capitellum with creamy-white lateral scales and a few brown dorsal ones. *Abdomen*. Terga brown scaled with a laterobasal white scaled patch on I-VII, dorsal pale scaled markings extremely variable, ranging from well developed white scaled basal bands (not reaching laterobasal white scaled patches) on II-VI to dorsal areas all brown scaled; sterna each brown scaled with a large triangular laterobasal white scaled patch which connects mesally on base of some sterna; terga and sterna with numerous golden setae, mostly along posterior margins. *Genitalia* (Figs. 9 and 25). The female genitalia of the lectotype of *incertus* are illustrated. The genitalia of this species are very uniform but vary from specimen to specimen in the number of short hair-like spicules on the basal area of the spermathecal eminence. The number of spicules range from a few to many, the lectotype having an intermediate number.

MALE. Similar to female in general habitus but with the following differences. *Head*. Antenna plumose, 0.87-0.95 length of proboscis; maxillary palpus 0.10-0.11 length of proboscis; proboscis 1.27-1.31 length of femur I. *Thorax*. Scutal fossal setae (2-4 anterior, 3-4 lateral and 1 posterior); 10-13 propleural setae; 3-4 upper and 8-12 posterior mesepisternal setae; 5-8 prealar knob setae; mesepimeron with 9-12 setae dorsad of scale patch. *Legs*. Posttarsi each with 2 ungues, I and II each with ungues unequal, each with a tooth, III with ungues equal, both simple. *Abdomen*. Terga I-VII each with a small laterobasal white scaled patch, dorsal white scaled markings variable, ranging from all dark dorsally to a well developed white scaled basal band which is continuous with laterobasal white scaled patch. *Genitalia*. As illustrated by Delfinado (1967, Fig. 8) and Klein (1973, Fig. 1). The tergoapical projection of the gonocoxite varies from sharply pointed to bluntly pointed (Fig. 25).

PUPA. The pupa is completely described here since the original description was incomplete. Chaetotaxy as recorded in Table 7. *Respiratory trumpet*. Heavily pigmented; index 3.91-5.29, average 4.62. *Abdomen*. Setae 6, 9-VII weakly developed; 4-VIII double to 5 branched; 9-VIII single. *Paddle*. Ovoid; minute serrations on distal portion of basal 0.67-0.72 of outer margin; minute spicules on apical 0.40-0.49 of outer and apical 0.15-0.23 of inner margins; midrib does not reach apex; seta 1-P moderately long, single; index 1.50-1.72, average 1.6.

LARVA. Chaetotaxy as recorded in Table 20. *Head.* Seta 4-C with 5-8 branches; 5-C double to 4 branched; 6-C double or triple; 7-C with 8-12 branches; 12-C with 6-9 branches; dorsomentum with 34-38 teeth. *Antenna.* Moderately long, lightly pigmented, with several small scattered spicules, more numerous on basal area; 2-A long, with a subapical constriction; 3-A short, 0.2-0.3 length of 2-A; 4-A moderately long, 0.54-0.70 length of 2-A; 6-A short, 0.28-0.39 length of 2-A. *Abdomen.* Seta 1-VIII with 5-9 branches; 3-VIII with 5-10 branches; 5-VIII with 7-12 branches; 2-X with 6-10 branches; ventral brush with 9-10 setae on grid and 2-3 precratal shorter ones, all multiple branched; saddle moderately pigmented, incompletely rings segment X, acus absent; 4 moderately long anal papillae; comb with 8-11 (usually 10) scales arranged in a single irregular row, each scale with a stout median apical spine and small denticles on laterobasal areas. *Siphon.* Moderately pigmented; index 2.51-3.06, average 2.71; pecten on basal 0.51-0.56 of siphon, composed of 8-12 (usually 10) teeth, apical 2-3 teeth longer and wider spaced than remainder of teeth, each tooth long, slender and with a small stout ventral denticle near base; seta 1-S short, triple to 5 branched, base attached on basal 0.64-0.65 of siphon distad of last pecten tooth.

DISCUSSION. The lectotype female of *incertus* has abdominal terga II-VI (remainder of abdomen missing) each brown scaled with a narrow tergobasal white scaled band and a small laterobasal white scaled patch which is not connected to the white scaled band. The holotype male of *dermajoensis* has abdominal terga I-IV each brown scaled with a small laterobasal white scaled patch. The male genitalia of the latter have a sharply pointed tergoapical projection of the gonocoxite (as in Delfinado 1967, Fig. 8). Two males from Sabah, Malaysia have identical genitalia to the type of *dermajoensis* but one has well developed basal white scaled bands on abdominal terga II-III and the other one has bands on terga II-VI. One male from Krabi, Thailand and 3 males from Cambodia have well developed basal white scaled bands on abdominal terga III-V and a few tergobasal white scales on II, one Cambodian specimen also with a band on VI, 2 additional Cambodian specimens have white bands on terga II-VII, and the genitalia of all 5 are identical to *dermajoensis* except the tergoapical projection of the gonocoxite which is bluntly pointed (as in Klein 1973, Fig. 1). Two males from Songkhla, Thailand have narrow basal white scaled bands on abdominal terga III-VI, a few tergobasal white scales on II and genitalia identical to *dermajoensis*. One male from the type-locality of *dermajoensis* has abdominal markings like *dermajoensis* but genitalia like the Cambodian males. A collection from Selangor, Malaysia contained 8 males all of which had genitalia similar to the holotype of *dermajoensis* but with basal white scaled bands on the following terga: III-V on 2 males, III-IV on 3 males, and no bands on 3 males. Four females from Cambodia, one female from Phangnga, Thailand and one female from Perak and 3 females from Selangor, Malaysia have abdominal markings similar to the lectotype of *incertus*. Three females from Songkhla, Thailand and one female from Sabah, Malaysia have abdominal terga each brown scaled with a small laterobasal white scaled patch and only 2-6 white scales tergobasally on terga III and IV, the Sabah specimen also with 1-3 white scales on II, however, 3 females from this same locality, one female from Narathiwat, Thailand and 4 females from Sabah, Malaysia, lacked tergobasal white scales. The above specimens demonstrate that the abdominal tergal markings are extremely variable and range from well developed tergobasal white scaled bands to lacking tergal white scales in both *incertus* and *dermajoensis*. The tergoapical projection of the gonocoxite is variable in the male genitalia of *dermajoensis* (Fig. 25). I can not find any differences between the immatures of *incertus* females and immatures of *dermajoensis* males. The larva and pupa of *incertus* are redescribed above. From the above evidence I believe *dermajoensis* to be conspecific with *incertus*.

Upon examination I found the pupal specimens of *dermajoensis*, studied and labeled by Delfinado (1967), to have seta 6-VII 4-5 branched (not single), 7-V triple to 7 branched (not single) and cephalothoracic seta 10-C double to 4 branched (not 5-6 branched). These setae conform to the branching of the setae on *incertus* and therefore support the above synonymy. In addition, the females of *incertus* and males of *dermajoensis* from Thailand reported by Delfinado (1967) came from the same collection.

Female genitalia of the above specimens are very uniform but vary in the number of small hair-like spicules on the basal area of the spermathecal eminence. The genitalia are similar to those of *rarus* and *panayensis* (see discussion of *rarus*).

Aedes incertus belongs to a species group with *panayensis*, *prioekanensis* and *rarus*. The female and male genitalia of this group show many similarities in their development.

TYPE-DATA. The lectotype female of *incertus* in the BMNH possesses the following adult label information: *A. Taeniata* [written on top of paper stage], Jungle 5th mile Gombak Rd., Kuala Lumpur, Midday, 29/2/04 [written on underside of paper stage]; co-type; Kuala Lumpur, Fed. Malay States, Dr. G. F. Leicester, 1912-350; ♀ lectotype, M. Delfinado, 1960; SEAMP Acc. No. 374; genitalia preparation number T73. 561. The holotype male of *dermajoensis* contains the following adult label information: *Aedes* (*Ae.*) *dermajoensis* n. sp. ♂ TYPE Brug; 18.153; Sumatra: Benkulen, xi-xii. 1929, Col. S. L. Brug, B. M. 1930-511; From larva in pool in virgin forest; SEAMP Acc. No. 376. Brug's field notes for this specimen differ somewhat from the label data and are as follows: *Ae. dermajoensis*, 18.153 type Br. Mus. [18. 153 is the specimen collection number], Marsh in low primary forest (Breeding place H) [translation kindly supplied by P. F. Mattingly], de Rook [collector], Dermajoe (Benkoelen), Nov.-Dec. 1929. The locality Benkoelen was spelled differently on the label attached to the holotype.

The lectotype female of *incertus* is in very poor condition and is as follows: only a fragment of thorax remains on a minuten pin; abdominal segments I-VI glued to paper stage; right and left midlegs and right hindleg glued to paper stage; the genitalia were mounted on a celluloid point but I remounted the genitalia in Canada balsam on a microscope slide (genitalia in good condition); remainder of specimen missing.

The holotype male of *dermajoensis* is in poor condition and is as follows: most of head missing, including appendages; thorax pinned through pleural areas of both sides with a minuten pin, pleural areas somewhat rubbed; abdominal segments I-IV and part of V intact and in good condition; right foreleg intact, left midleg mounted in balsam on a celluloid point with genitalia, remaining legs missing; both wings in fair condition; genitalia mounted in a drop of balsam on a celluloid point and in good condition.

DISTRIBUTION. 73 specimens examined: 26♀, 21♂, 1 pl, 14 with asscoiated skins (4 p, 10 l).

CAMBODIA. *Kompong Sela*, Stung Chral; 3♀, 3♂. *Kompong Som*, Sihanoukville; 1♀. *Siem Reap*, Angkor Forest; 2♂.

INDONESIA. *Sumatra*, Dermajoe (Benkoelen); 1♂ (holotype of *dermajoensis*), 2♀, 1♂.

MALAYSIA. *Perak,* Tanjong Tualang Forest Reserve; 1♀. *Sabah,* Beaufort; 5♀, 1♂ pl, 1♂. *Selangor,* Kuala Lumpur; 1♀ (lectotype of *incertus*), Templer Park; 3♀, 1♂ pl, 1♂ p, 7♂.

THAILAND. *Krahi,* Ban Phru Toei; 1♂ p. *Narathiwat,* Amphoe Waeng, Soi Teo; 2♀ pl. *Phangnga,* Nam Tai; 1♀. *Songkhla,* Amphoe Haad Yai, Ton Nga Chang Waterfalls; 6♀ pl, 1♀, 2♂ p, 1 pl.

BIOLOGY. In Thailand immatures were collected from small and large flood pools in dry stream beds and a small seepage pool; from clear or turbid, fresh, unmoving, temporary water in partially shaded areas; located in secondary rain forests; and at elevations from 46-80 m.

In Malaysia immatures were collected from small flood and ground pools containing clear, fresh, unmoving, temporary water, in partially and heavily shaded areas located in secondary rain forests in hilly and valley terrains, and at elevations of 30-152 m. In Perak a female was taken biting man in a secondary rain forest between 0800-1050 hours.

AEDES (VERRALLINA) INDECORABILIS (LEICESTER)
(Fig. 21)

DISCUSSION. *Aedes indecorabilis* was described by Leicester (1908: 200) from 2 cotypes, a male and a female, which he stated (page 201) were "Bred from larvae taken in a small jungle pool near Kuala Lumpur." Only the 2 damaged adults remain, the associated immature skins could not be located and are presumed lost. The cotype male possesses the following information, in Leicester's handwriting, on the underside of the paper stage holding the adult: Larva fr. pool in jungle patch Gombak Rd. 5 miles fr. Kuala Lumpur, 29/2/04; however, the female cotype contains the following handwritten information on the underside of the paper stage: Jungle 5th mile Gombak Rd., 11/2/04. The above label data indicate that both the cotypes were collected in the same locality but on different days in February 1904 and no mention is given of the female being reared. The adults of both cotypes are badly damaged but the habitus and chaetotaxy of both are very similar. I am therefore considering that the male and female cotypes are conspecific. Delfinado (1967: 26) selected the male cotype as lectotype and redescribed and illustrated both the male and female. Klein (1973: 6) also redescribed and illustrated specimens from Cambodia which he attributed to this species. I have compared Klein's Cambodian specimens with the male and female cotypes of *indecorabilis* and can find no apparent differences in the adult habitus and male genitalia; however, the female genitalia (Fig. 21) of the Cambodian specimens are markedly different from the cotype female (Fig. 21) of *indecorabilis* and are very similar to those of *stungus* (Fig. 21). The adults of *stungus* differ in abdominal marking from these specimens. Klein's female specimens therefore may belong to a new species. The correct association of sexes of *indecorabilis* can not be solved with the present specimens and must wait until sibling reared males and females become available.

DISTRIBUTION. 6 specimens examined: 1♀, 5♂.

CAMBODIA. *Kompong Sela,* Phnom Praung; 2♂ (3♀ examined by me from this locality, sent by Dr. Klein, do not belong to this species--see discussion above).

MALAYSIA. *Selangor,* Kuala Lumpur; 1♂ (lectotype), 1♀ (paralectotype).

THAILAND. *Nakhon Si Thammarat,* Amphoe Chawang, Ban Tha Phon; 2♂ genitalia.

BIOLOGY. The 2 males from Thailand were taken in a light trap situated in light forest vegetation on 21 September 1962 between 1800 and 0600 hours (collection number T-1593).

Leicester (1908: 201) reports the types were reared from larvae taken in a small jungle pool in Malaysia. In Cambodia Klein (1973: 6) found larvae in jungle pools.

AEDES (VERRALLINA) INDICUS (THEOBALD)
(Figs. 10, 30, 44, 54, 58, 60, 64)

Aedes indicus is the representative species for Series III, Section A, and is therefore completely redescribed below.

FEMALE (Fig. 64). *Head.* Antenna dark brown, 0.99-1.03 length of proboscis, pedicel dark brown with a few small dark scales and short fine dark hairs mesally, flagellomere 1 with basal 0.65 pale and with several small dark scales near middle, flagellar whorls with 6 dark setae; clypeus dark brown, bare; maxillary palpus blackish-brown scaled, 4 segmented, 0.16-0.20 length of proboscis; proboscis blackish-brown scaled; 1.14-1.26 length of femur I; eyes nearly contiguous; ocular setae dark brown and well developed; scales on head broad, dark brown and decumbent except interocular space, ocular line and occiput each of which has narrow curved white scales, similar scales on vertex forming a single row on each side of coronal suture from occiput to near ocular line, occiput with a number of short brown erect forked scales and a few broad white scales along anterior margin of narrow scaled area, a narrow stripe of broad white scales on lateral surface extending from area in front of antepronotum to ocular line, postgena with broad creamy colored scales. *Thorax.* Scutal integument dark brown; scutum covered with narrow curved dark reddish-brown scales except for narrow curved white scales on median anterior promontory area, anterior scutal fossal area, supra-alar area and along lateral margins of prescutellar space; prescutellar space bare; scutellum with a patch of narrow curved white scales on each lobe, a few similar brown scales basally on median lobe; dark reddish-black setae on the following areas: 2-4 median anterior promontory, numerous acrostichals (anterior and posterior), numerous dorsocentrals (anterior and posterior), scutal fossal (3-6 anterior, 5-7 lateral, 1-3 median and 2-5 posterior), numerous supra-alar, 5-7 posterior medial scutal, 1 postalar callar and scutellar (8-11 long and 3-5 short ones on lateral lobe, 5-11 long and 3-5 short ones on median lobe); pleural integument dark brown; antepronota widely separated, without scales, 14-23 long and short dark setae; postpronotum with narrow curved brown scales on upper area and several similar white ones on posterior area cephalad of setae, 5-8 posterior dark setae; propleuron with a patch of broad white scales, 8-13 setae; prosternum, subspiracular area, mesomeron and metameron bare; postspiracular area with several narrow curved white scales, 6-10 dark setae; paratergite with a few narrow curved white scales laterally (rubbed off in some specimens); mesepisternum with an upper and a lower patch of broad white scales, 3-4 upper and 9-15 posterior dark setae; prealar knob with 1-3 long moderately broad scales (2 specimens), 10-14 dark setae; mesepimeron with a patch of broad white scales near center, dorsal ones longer and somewhat narrower, 10-18 setae (several hair-like) dorsad of scale patch (a few long scales also usually dorsad of setae), 2-4 small golden hairs along posterior margin of scale patch. *Legs*. Coxae I-III each with several dark setae, I with broad brown scales and a small dorsal patch of white ones on anterior surface, II and III each with a patch of broad white scales on outer area of anterior surface; trochanters I-III each with broad pale scales; femora I and II each with anterior surface brown scaled, I with scales paler brown colored, II with a narrow longitudinal anteroventral pale stripe, III with most of anterobasal area pale scaled, I-III each with a few white apical anterior and posterior scales, I-III with posterior surfaces mainly pale scaled, I with a narrow longidudinal posteroventral brown scaled stripe, II and III each with a posterodorsal longitudinal brown scaled stripe which is narrow basally and broader apically; tibiae I-III each dark brown scaled, I and III each with a broad posteroventral longitudinal pale scaled stripe, II with posterior surface pale scaled; tarsi I-III each dark brown scaled; posttarsi I-III (Fig. 60) each with 2 ungues, I and II with ungues equal, each ungue with a tooth, III with ungues equal, both simple. *Wing*. Dorsal and ventral veins with dark brown scales; alula with several moderately broad and a few narrow brown scales on margin; upper calypter with several pale setae on margin; 1-3 remigial setae. *Halter*. Pedicel pale; capitellum creamy-white scaled with dorsal ones pale brown. *Abdomen*. Terga blackish-brown scaled with white markings as follows: I with a few dorsomedian white scales and laterotergite covered with white scales, II-VI each with a narrow laterobasal white scaled patch, II-VII each with a dorsomedian transverse white scaled band which extends cephalad and attached to base on lateral margin, bands joined to lateral white scaled patches on IV-VII, bands incomplete on tergomesal areas of V-VII, VIII with a number of scattered white scales; sterna brown scaled with laterobasal pale scaled areas; terga and sterna with numerous golden setae, mostly along posterior margins. *Genitalia* (Fig. 10). Tergum VIII moderately pigmented with a lightly pigmented median basal area, wide, base slightly concave, apex gently convex, a number of short and moderately long thin setae at apex and similar ones scattered over apical 0.50-0.67, basolateral seta present, covered with minute spicules, numerous broad scales covering apical 0.65-0.75, basal 0.4-0.6 retracted into segment VII, VIII-Te index 0.54-0.57, VIII-Te/IX-Te index 5.48-6.00; sternum VIII moderately pigmented, wide, base concave mesally, apex with a shallow median indentation with a small lobe on each side of midline, numerous moderately long setae apically, more numerous and slightly stouter on apical lobes, numerous short and a few moderately long setae scattered over apical 0.85-0.88, covered with minute spicules, numerous broad scales covering most of apical 0.77-0.87, apical intersegmental fold unpigmented, VIII-S index 0.61-0.62 tergum IX moderately pigmented, very wide and short, ribbon-like, setae absent, covered with minute spicules, IX-Te index 0.16-0.17; insula unpigmented, short, covered with minute spicules, 5-6 small tuberculi, each with a small spicule; lower vaginal lip heavily pigmented, narrow, without spicules except a few on outer margin of hinge area, with a small caudally projecting heavily pigmented median apodeme, lower vaginal sclerite composed of a pair of sigmoid-shaped heavily pigmented structures situated lateromesad on an elevated portion of the membrane extending over area between the vaginal lip; upper vaginal lip heavily pigmented, complex, lateral surfaces forming wide parallel plates which produce sharp posterior angles and curve sternally and then mesad to form a continuous band, a strong apodeme extends mesad from near midpoint of dorsal surface of lateral area and forms a large continuous upright shield surrounding posterior portion of spermathecal eminence, spicules only along posterior margin of upper vaginal lip, upper vaginal sclerite heavily pigmented, extremely large and complex, base attached along entire lateral margin of upper vaginal lip except for a short posterior area, a large caudal arm extends mesad and forms a crown around the posterior portion of the spermathecal eminence, posterior area of sclerite not pigmented, cephalic arm very large forming a continuous broad band around anterior of spermathecal eminence, wrinkled, fenestrated and with a mesal transverse slit; spermathecal eminence heavily pigmented, large, deep in depth, ovoid in dorsal outline, long spiny excrescences with lateral projections attached to cephalic area; spermathecal eminence, upper vaginal lip and upper vaginal sclerite cover nearly entire upper vaginal area with heavily pigmented structures; postgenital lobe short, narrow, apex with a moderately deep median indentation, 8-15 setae on each side of midline, completely covered with small spicules, dorsal PGL index 0.94-1.29, ventral PGL index 1.06-1.44; peri-anal membrane with minute spicules; cercus triangular in shape, moderately long, broad at base, apex acute, completely covered with small spicules, dorsal surface with a number of moderately long and a few short setae scattered over entire area, ventral surface with several short and moderately long setae on outer 0.4, a number (14 or more) broad scales scattered over entire dorsal surface, cercus index 3.33-3.86, cercus/dorsal PGL index 3.00-4.63; 3 seminal capsules, 1 large, 1 medium and 1 small in size, heavily pigmented, elliptical, each with a moderately broad neck, several small seminal capsule pores near orifice, base of accessory gland duct unpigmented to lightly pigmented.

MALE. Similar to female in general habitus but with the following differences. *Head.* Antenna plumose, 10-11 setae in whorls, 1.03-1.14 length of proboscis; maxillary palpus 0.14-0.18 length of proboscis; proboscis 1.06-1.21 length of femur I; vertex without narrow scales on coronal suture. *Thorax.* Scutellar setae (4-7 long and 2-4 short ones on lateral lobe, 4-8 long and 2-4 short ones on median lobe), 7-11 antepronotal setae; 4-5 postpronotal setae; 7-8 propleural setae; 2-3 postspiracular setae; 5-6 prealar knob setae; mesepimeron with 5-8 setae dorsad of scale patch and 1-2 hairs posterior to patch. *Legs.* Posttarsi I-III (Fig. 58) each with 2 ungues, I and II each with ungues unequal, larger one with a tooth, III with ungues equal, both simple. *Abdomen.* Terga with laterobasal white patches which usually extend slightly onto dorsal surfaces. *Genitalia* (Fig. 30). Tergum IX heavily pigmented, bandlike with lateral areas broad, cephalic margin evenly concave, outer caudal margin fused to tergum X, setae absent, broadly connected laterally to sternum IX; gonocoxite short, broad, heavily pigmented, mesal surface membranous with minute spicules, dorsal surface with apex extended into a long flattened broad lobe with 4-5 short setae in a small patch on basomesal area, a number of short and long stout setae on apical 0.8, ventral surface with a number of short and long stout setae on apical 0.6, a number of broad scales on ventral and lateral surfaces of gonocoxite; gonostylus moderately pigmented, moderately long (approximately 0.73 length of gonocoxite minus apical lobe), narrow, curved, base with a small lobe, apex pointed and tip recurved, 1-2 short thin setae subapically, attached subapically on gonocoxite; basal mesal lobe moderately pigmented, consists of a basal lobe with 18-19 dorsal short thin setae and 15-17 short stout flattened acuminate setae on mesal surface, a broad flat extension onto mesal membrane of gonocoxite which bears 8-9 short fine setae and minute spicules, and an apical long curved arm which resembles the gonostylus, lobe connected mesally with its mate by a narrow moderately pigmented band covered with minute spicules and located ventrad of apical portion of prosophallus and phallus; proctiger with paraproct formed into a heavily pigmented long slender slightly curved acuminate arm with basal area expanded and connected to tergum IX, base also with a short projection which extends ventrad and articulates at a point on the dorsomesal surface of the parameral apodeme near base of opisthophallus, base of proctiger lightly fused with tergum X, cercus membranous and without cercal setae; tergum X heavily pigmented, consists of a small rectangular plate laterad of paraproct base and extended ventrally from caudal margin of tergum IX; phallosome complex, opisthophallus--consists of a lightly to moderately pigmented tergal transverse bridge between parameral apodemes, caudal margin slightly indented mesally, sternobasal area attached to tergobasal portion of outer area of prosophallus, located dorsad of phallus and prosophallus and ventrad of proctiger, phallus--consists of a pair of moderately long, heavily pigmented, narrowly separated, caudally produced arms which are fused together by a narrow basal plate which extends laterally and is fused to tergobasal portion of prosophallus, apex of phallus formed into a tergal penis filament which consists of a small lightly pigmented and sclerotized lobe produced cephalad, prosophallus--consists of a pair of moderately long widely separated acuminate arms, each arm with distal portion heavily pigmented and slightly curved, proximal portion lightly pigmented, formed into a broadly rounded area which is attached to tergomesal portion of paramere, located laterad and slightly ventrad of phallus, prosophallic arm approximately equal in length to phallic arm, paramere--heavily pigmented, approximately equal in length to phallic arm, articulates at a point approximately 0.65 from base with caudal area of parameral apodeme, parameral apodeme--moderately to heavily pigmented, moderately long, outer surface broadly attached to tergobasal apodeme of gonocoxite; sternum IX heavily pigmented throughout, large, broad, lateroapical areas rounded, 15 short and moderately long setae in an elongate patch along caudal margin.

PUPA (Fig. 44). Chaetotaxy as figured and recorded in Table 8. Ocular plate with moderately developed cuticular facets. *Respiratory trumpet.* Heavily pigmented; hair-like spicules on distal 0.57-0.60 of inner surface; index 2.53-3.45, average 2.88. *Abdomen.* Setae 6, 9-VII weakly developed; 4-VIII single to triple; 9-VIII single or double. *Paddle.* Ovoid; minute serrations on most of basal 0.68-0.72 of outer margin; minute spicules on apical 0.35-0.38 of outer and apical 0.13-0.15 of inner margins; midrib does not reach apex; seta 1-P moderately long, single; index 1.43-1.68, average 1.56.

LARVA (Fig. 54). Chaetotaxy as figured and recorded in Table 21. *Head.* Seta 4-C double to 5 branched; 5-C triple; 6-C double to 4 branched; 7-C with 7-12 branches; 12-C with 4-9 branches; dorsomentum with 35-40 teeth. *Antenna.* Moderately long, moderately pigmented, with several small scattered spicules, more numerous on basal area; seta 1-A double or triple, moderately long, branches thickened; 2-A long, with a subapical constriction; 3-A short, 0.19-0.26 length of 2-A; 4-A moderately long, 0.31-0.45 length of 2-A; 6-A short, 0.20-0.26 length of 2-A. *Abdomen.* Seta 1-VIII double to 5 branched; 3-VIII with 6-10 branches; 5-VIII with 7-12 branches; 2-X with 9-11 branches, all branches approximately equal in length; ventral brush with 12-14 setae on grid and 2-3 precratal shorter ones, all multiple branched; saddle moderately pigmented, incompletely rings segment X, acus absent; 4 moderately long anal papillae; comb with 8-12 (usually 10) scales arranged in a single curved irregular row, each scale with a stout median apical spine and small denticles on laterobasal areas. *Siphon.* Moderately pigmented; acus well developed; index 1.68-2.37, average 1.88; pecten on basal 0.56-0.65 of siphon, composed of 11-15 (usually 12) teeth, apical 2 teeth longer and wider spaced than remainder of teeth, each tooth long, slender and with 1-3 small stout ventral denticles near base; seta 1-S short, triple to 5 branched, base attached on basal 0.70-0.77 of siphon distad of last pecten tooth.

DISCUSSION. Delfinado (1967: 4, 25) reported Thailand as a new country record for *indicus* based on 2 females. After examining the 2 Thailand specimens and comparing them with the types of *indicus*, *nigrotarsis* and *phnomus* it was apparent these 2 females did not belong to either *indicus* or *nigrotarsis*. The above Thailand record for *indicus* is therefore incorrect.

The adult habitus of the 2 Thailand specimens compares well with that of the type of *phnomus*, a species for which the female is unknown. There appears to be no consistent difference in the adult habitus of the 3 included species in this group (e. g. *indicus*, *nigrotarsis* and *phnomus*) except the absence of scales on the paratergite of *nigrotarsis* and *phnomus*; however, these scales are missing (rubbed off?) in some specimens of *indicus*. These 3 species are easily distinguished from each other and from other species of the subgenus by characters of both the male and female genitalia.

Since the adults of the 2 females from Thailand can not be separated with certainty, using habitus features, from *indicus*, *nigrotarsis* or *phnomus*, the female genitalia are different from those of *indicus* and *nigrotarsis*, the female is not known for *phnomus*, and the collection sites of the 2 Thailand specimens are close geographically and are apparently similar in climatic and ecological conditions to the type locality of *phnomus*, I am provisionally assigning these 2 Thailand females to *phnomus*. This of course can not be confirmed until progeny reared males and females with associated immature skins are obtained.

After examining the types of both *indicus* and *mediofasciata* I agree with Edwards (1922b: 468) that the 2 are conspecific.

TYPE-DATA. The holotype female of *indicus* bears the following label data: *Neomacleaya indica* Type ♀ F. V. T.; India, S. Christophers; Nov. Spec., Nov. gen. nr. *Macleaya*, (a drawing of vertex of head and scutellum); 27 [on circular paper pining stage]; Received from F. V. Theobald, 1907-29; T73. 211 Term. [my genitalia preparation number]; SEAMP Accession No. 374. The holotype, deposited in the BMNH is in good condition (head and one leg are broken off and glued to the circular paper stage) and the genitalia are mounted in Canada balsam on a microscope slide.

Theobald (1907: 544) originally described *Skusea mediofasciata* from 3 female and one male syntypes which are deposited in the BMNH. The male, mounted in Canada balsam on 2 microscope slides (male genitalia and abdomen on one slide and remaining parts mounted on second slide), is hereby designated lectotype and bears the following information on the slide labels: *Skusea mediofasciata* n. sp. ♂, India, Received from F. V. Theobald, 1907-29, SEAMP Accession No. 374; allolectotype is designated for one female and bears the following data on the adult labels: *Skusea mediofasciata* (Type) F. V. T., 27. F., India, S. Christophers, Received from F. V. Theobald, 1907-29., SEAMP Accession No. 374; paralectotype designation is made for 2 females, one with same label data as allolectotype except absence of 27. F., and the other female with the following label information: India, S. Christophers, 18, Received from F. V. Theobald, 1907-29., SEAMP Accession No. 374 (this specimen I believe to be part of the original type series because of the same handwritten Christophers label, the received from Theobald label and the same type of circular paper card mount as the other 2 females; however, this specimen does not bear the identification label of Theobald). The abdomens and genitalia of all 3 females are missing.

DISTRIBUTION. 73 specimens examined: 32♀, 14♂, 4 pl, 1 l, 3 L, 8 with associated skins (7 l, 1 l incomplete).

INDIA. 1♀ (holotype of *indicus*), 3♀, 1♂ (1♂ lectotype, 1♀ allolectotype, and 2♀ paralectotypes of *mediofasciata*). *Bihar,* Pusa; 5♀, 1♂. *Delhi,* Roshanara Gardens; 3♀, 1♂. *Punjab,* Amritsar, Karnal; 4♀ pl, 14♀, 3♂ pl, 1♂ l, 7♂, 4 pl, 1 l, 3 L.

SRI LANKA. 1♀. Patanthaw; 1♀.

BIOLOGY. Immatures were collected in India from water in rain-filled ditches and open pools (Barraud 1934: 286).

AEDES (VERRALLINA) JOHNSONI LAFFOON

(Figs. 22, 25, 59, 60)

DISCUSSION. *Aedes johnsoni* had previously been separated from the other members of a species complex (i.e. *adustus, andamanensis, margarsen,* and *sohni*) by characters of the male genitalia and geographical distribution. Adults of *johnsoni* can now be easily distinguished from the other species of the group by the absence of setae (Fig. 22) on the prosternum (see discussion under *adustus*). *Aedes johnsoni* is most similar to *margarsen* and at present can only be separated with certainty by the prosternal feature. When the prosternum was used to separate the adults of these 2 species it was found a large number of the paratypes of *johnsoni* possessed setae on this structure and therefore belong to *margarsen.* With this finding, the geographical ranges of these 2 species now overlap.

The basal mesal lobe of the male genitalia of *johnsoni* is illustrated (Fig. 25) and compared to the other members of the group. Illustrations are given for the first time of tarsomeres 5 and posttarsi of the male (Fig. 59) and the female (Fig. 60).

DISTRIBUTION. 25 specimens examined: 19♀, 6♂.

PHILIPPINES. *Basilan Island,* Isabela; 3♀ (paratypes). *Mindanao,* Pasanonco; 2♀, 2♂ (paratypes) and 1♂ (holotype), San Ramon; 8♀, 2♂ (paratypes), Kabakan; 6♀, 1♂.

The above specimens were the only ones of *johnsoni* remaining in the USNM when the newly found character (presence or absence of setae on the prosternum) was used. Thirty-seven female and 33 male paratypes of *johnsoni* had setae present on the prosternum and are therefore transferred to *margarsen* (see distribution of *margarsen*).

AEDES (VERRALLINA) JOHORENSIS NEW SPECIES

(Figs. 11, 61, 65)

FEMALE (Fig. 65). *Head.* Antenna dark brown, 0.96-1.10 length of proboscis, pedicel mostly dark brown with a few small dark brown scales and short fine hairs mesally, flagellomere 1 with basal 0.35-0.50 pale and with several small brown scales near middle; clypeus dark brown, bare; maxillary palpus blackish-brown scaled, 4 segmented, 0.16-0.17 length of proboscis; proboscis blackish-brown scaled, 1.11-1.24 length of femur I; eyes contiguous; ocular setae blackish-brown and well developed; scales on head all broad, blackish-brown and decumbent except for narrow curved white scales forming a double row along coronal suture, a few on occiput and along ocular line, and a narrow stripe of broad white scales extending from area in front of antepronotum to ocular line, postgena with a few broad pale brown scales; occiput with numerous brown erect forked scales. *Thorax.* Scutal integument dark brown; scutum covered with narrow curved reddish-brown scales except for the following areas which have narrow curved creamy-white scales; a patch on anterior scutal fossal area and extending onto lateral scutal fossal area, a small patch at scutal angle, a large patch on supra-alar area, and along lateral and anterior margins of prescutellar space; prescutellar space bare except for a small median cephalad area with scales; scutellum with narrow curved creamy-white scales on each lobe; dark reddish-black setae on the following areas: 5-7 median anterior promontory, numerous acrostichal (anterior and posterior), numerous dorsocentral (anterior and posterior), scutal fossal (5-9 anterior, 5-7 lateral and 1-2 posterior), numerous supra-alar, 6-8 posterior medial scutal, 1 postalar callar and scutellar (6-11 long and 4-6 short ones on lateral lobe, 5-8 long and 6-9 short ones on median lobe); pleural integument dark brown; antepronota widely separated, scales absent, 20-28 short and long dark setae; postpronotum with narrow curved reddish-brown scales on upper area and a few broad white ones below, 6-8 posterior dark setae, a few short hairs on area cephalad of lower seta; propleuron with a patch of broad white scales, 16-26 setae; prosternum, subspiracular area, paratergite, mesomeron and metameron bare; postspiracular area without scales, 5-13 brown setae; mesepisternum with a large upper and a small lower patch of broad white scales, 5-8 upper and 14-21 posterior setae, a patch of short hairs cephalad of lower scale patch and another patch cephalad of upper patch next to subspiracular area; prealar knob without scales, 15-29 brown setae; mesepimeron with a patch of broad white scales near middle, 24-55 setae dorsad of scale patch (several hair-like), numerous moderately long fine golden hairs posterior of scale patch and extending to near lower margin of sclerite. *Legs*. Coxae I-III each with several setae, I with broad brown scales and a small dorsal patch of white ones on anterior surface, II and III each with a patch of broad white scales on anterior surface; trochanters I-III each with broad white scales; femora I and II with anterior surfaces brown scaled except for a narrow ventral longitudinal stripe of white scales on II, posterior surfaces of I and II each brown scaled with a longitudinal stripe of white scales, stripe dorsal on I and ventral on II, anterior and posterior surfaces of each white scaled with a dorsal longitudinal stripe of brown scales, stripe becomes broader distally and forms an apical band, I-III each with a few lateroapical white scales on anterior and posterior surfaces; tibiae I-III each brown scaled, I and II also with a posterior longitudinal white stripe, stripe ventral on I and mesal on II; tarsi I-III brown scaled; posttarsi I-III (Fig. 61) each with 2 ungues, I and II with ungues equal each with a tooth, III with ungues equal, both simple. *Wing*. Dorsal and ventral veins with dark brown scales; alula with several moderately broad brown scales on margin; upper calypter with several brown setae on margin; 2-3 remigial setae. *Halter*. Pedicel pale; capitellum dark brown scaled. *Abdomen*. Terga dark brown scaled, laterotergite of I with a rectangular patch of white scales, II-VII each with a large laterobasal patch of white scales; sterna II-VII each white scaled with a narrow apical band of brown scales, VIII brown scaled; terga and sterna with a number of golden-brown setae, mostly along posterior margins. *Genitalia* (Fig. 11). Tergum VIII moderately to heavily pigmented, wide, base slightly concave, apex very slightly concave, a number of short, moderately long and long setae at apex (a number of them stout), short and moderately long thin setae scattered over apical 0.42-0.47, basolateral seta minute, covered with minute spicules, numerous broad scales covering apical 0.71-0.77, basal 0.45-0.50 retracted into segment VII, VIII-Te index 0.49-0.52, VIII-Te/IX-Te index 3.13-3.26; sternum VIII moderately to heavily pigmented, wide, base slightly concave mesally, apex with a small median indentation with a small lobe on each side of midline, numerous short and moderately long setae apically, more numerous and slightly stouter on apical lobes, numerous short and a few moderately long setae scattered over apical 0.78-0.94, covered with minute spicules, numerous broad scales covering most of apical 0.85-0.96, apical intersegmental fold unpigmented, VIII-S index 0.57-0.66; tergum IX moderately pigmented, wide and short, setae absent, covered with minute spicules, IX-Te index 0.25-0.28; insula unpigmented, short, covered with minute spicules, 5-6 small tuberculi, each with a minute spicule; lower vaginal lip heavily pigmented, narrow, a few spicules on hinge area, with a small caudally projected moderately pigmented median apodeme, lower vaginal sclerite composed of small elongated heavily pigmented plates situated on median basal area of vaginal floor; upper vaginal lip heavily pigmented, moderately broad, posterolateral areas produced into small rounded lobes, median posterior area produced into a small shield caudad of spermathecal eminence, upper vaginal sclerite produced into a moderately broad heavily pigmented transverse band which projects mesad from basal area of upper vaginal lip and forms a continuous crown around the posterior margin of the spermathecal eminence; spermathecal eminence heavily pigmented, large, moderately deep in depth, dorsal outline somewhat ovoid with basal area flat, short spiny excrescences on basal and basolateral areas, a few longer and stouter ones at basolateral corners; postgenital lobe short, moderately broad, apex with a small median indentation, 20-25 setae on each side of midline, completely covered with minute spicules, dorsal PGL index 0.58-0.69, ventral PGL index 0.76-0.91; peri-anal membrane with minute spicules; cercus triangular in shape, moderately long, broad at base, apex acute, completely covered with minute spicules, dorsal surface with a number of moderately long and a few short setae scattered over apical 0.84-0.90, 2-3 long setae at apex, ventral surface with several short and a few moderately long setae on outer 0.40-0.55, 2-6 broad scales on dorsal surface, cercus index 2.58-2.97, cercus/dorsal PGL index 3.55-3.89; 3 seminal capsules, 1 large, 1 medium and 1 small in size, heavily pigmented, elliptical, each with a number of small seminal capsule pores near orifice, base of accessory gland duct lightly pigmented.

MALE, PUPA, LARVA AND EGG. Not known.

DISCUSSION. Adult females of *johorensis* are very similar in habitus to members of the *uncus* Group. They differ in having the lateral white scaled patches of the abdominal terga larger in size. The description of the adult of *agrestis* by Barraud (1931: 613) also appears to be similar to *johorensis*; however, a few differences appear to be present between the 2 species. The adult body of the type of *agrestis* is lost so that these features can not be compared.

The female genitalia are most similar to those of *petroelephantus*. They differ from those of this species, however, in the development of the lower vaginal sclerite, upper vaginal lip, spermathecal eminence and tergum IX (compare Figs. 11 and 15). The lower vaginal sclerite is similar to *agrestis* but differs strongly in the other genitalia features (compare Figs. 3 and 11).

TYPE-DATA. Holotype female (genitalia mounted on a slide in Canada balsam) with the following collection data: MALAYSIA, *Johore*, Pontian Besar, 3 August 1969, Sulaiman bin Omar and Chia Yien Wang collectors, collection number 2860, genitalia preparation number T74.66, MEP accession number 409, collected as an adult in a biting collection on a clear day, among coconut palms in a village, in partial shade at 1010 hours and at sea level; 6 female paratypes, same data as holotype except 3 with genitalia preparation numbers 74/398, 74/399 and 74/448; and one female paratype genitalia (adult lost), INDONESIA, *Sumatra*, Djambi, Moearatebo, XI. 1922-II. 1923, de Rook collector, collection number 9812, *Ae.* (*Ae.*) Sp. 6, ♀ hypopygium, imago neg.

Holotype and 5 paratypes deposited in the USNM. One paratype will be deposited in the BMNH and one paratype will be deposited in the Shivaji Ramalinggam Collection at the University of Malaya. All types in excellent condition except the adult body is missing for the Indonesian specimen.

DISTRIBUTION. Known only from the localities in Indonesia and Malaysia where the type-specimens were collected.

BIOLOGY. As listed in the type-data.

AEDES (VERRALLINA) LANKAENSIS STONE AND KNIGHT
(Fig. 12)

The following information on the female is based on a specimen from Colombo, Sri Lanka and supplements the very brief description of Wijesundara (1951: 174).

FEMALE. *Head.* Antenna dark brown, 1.12 length of proboscis, pedicel brown with a few small brown scales and short fine hairs mesally; clypeus brown, bare; maxillary palpus dark brown scaled, 0.18 length of proboscis; proboscis dark brown scaled, 1.06 length of femur I; scales on head broad dark brown and decumbent except a few narrow curved brown scales on coronal suture and a stripe of broad white scales on lateral surface extending from in front of antepronotum to ocular line; occiput with a number of short brown erect forked scales, a few broad white decumbent scales and a number of narrow curved brown ones. *Thorax.* Scutal integument dark brown; scutum covered with narrow curved reddish-brown scales and with a few paler ones on median anterior promontory and anterior scutal fossal areas; prescutellar space bare; scutellum with a patch of narrow curved reddish-brown scales on each lobe; dark brown setae on following areas: 2 median anterior promontory, numerous acrostichals (anterior and posterior), numerous dorsocentrals (anterior and posterior), scutal fossal (4-5 anterior, 3-4 lateral and 1 posterior), numerous supra-alar, 6 posterior medial scutal, 1 postalar callar and scutellar (6 long and 2-3 short ones on lateral lobe, 5 long and 4 short ones on median lobe); pleural integument dark brown; antepronotum without scales, 13-14 dark setae; postpronotum with narrow curved brown scales on upper area, 4-5 dark posterior setae; propleuron with a patch of broad white scales, 9-10 setae; prosternum, subspiracular area, paratergite, mesomeron and metameron bare; postspiracular area without scales, 3-4 dark setae; mesepisternum with an upper and a lower patch of broad white scales, 3 upper and 11-12 posterior setae, lower ones shorter and pale; prealar knob with 8-9 dark setae; mesepimeron with a patch of broad white scales near center, 11 setae dorsad of scale patch, several thin golden hairs along posterior and lower posterior margins of scale patch. *Legs.* Coxae I-III each with several setae, I with broad brown scales and a small dorsal and a small anteroventral patch of white scales, II and III each with a patch of broad white scales on anterior surface; femora I and II each with anterior surface brown scaled, posterior surface brown scaled with a longitudinal white scaled stripe, ventral on I and dorsal on II, III with most of anteroventral and posteroventral areas white scaled, remainder brown scaled; tibiae I-III brown scaled, I also with a posteroventral longitudinal white scaled strip, II also with a posteromedian longitudinal white scaled stripe; tarsi I-III each brown scaled; posttarsi I-III each with 2 ungues, I and II with ungues equal, each with a tooth, III with ungues equal, both simple. *Wing.* Dorsal and ventral veins with brown scales; alula with several narrow dark brown scales on margin; upper calypter with several dark setae on margin; 2 remigial setae. *Halter*. Pedicel pale; capitellum brown scaled. *Abdomen*. Terga each dark brown scaled with a large laterobasal white scaled patch; sterna each white scaled with a narrow apical brown scaled band; terga and sterna with numerous brown setae, mostly along posterior margin. *Genitalia* (Fig. 12). As illustrated; spermathecal eminence long and narrow; upper vaginal sclerite with a broad anteromesal extension; and lower vaginal sclerite small, moderately pigmented and spiculate.

DISCUSSION. The female genitalia are illustrated (Fig. 12) and show for the first time the lower vaginal lip and sclerite, terga VIII and IX, sternum VIII and seminal capsules. The male genitalia were described and illustrated by Edwards (1917: 221).

DISTRIBUTION. 2 specimens examined: 1♀, 1♂.

SRI LANKA. Colombo; 1♂ (holotype) and 1♀.

AEDES (VERRALLINA) LATIPENNIS DELFINADO
(Figs. 13, 61)

FEMALE. *Thorax*. Mesepimeron with numerous fine hairs caudad of scale patch and extending to near lower margin of sclerite. *Legs*. Posttarsi I-III (Fig. 61) each with 2 ungues, I and II with ungues equal in size, each with a tooth, III with ungues equal, both simple. *Genitalia* (Fig. 13). Tergum VIII moderately pigmented, wide, base slightly concave, apex broadly convex, basolateral seta present, index 0.41-0.42; sternum VIII moderately pigmented, wide, apical margin with a small lobe on each side of midline and a larger lobe on lateroapical area, index 0.53-0.56; lower vaginal sclerite formed into 2 large, heavily pigmented, reticulated plates which are spiculate and narrowly separated.

PUPA. Chaetotaxy as recorded in Table 9. Ocular plate with a small area of moderately developed cuticular facets. *Respiratory trumpet*. Moderately pigmented, hair-like spicules on distal 0.73-0.90 of inner surface; index 3.73-4.33, average 4.12. *Abdomen*. Seta 6, 9-VII weakly developed; 4-VIII triple to 4 branched; 9-VIII single. *Paddle*. Ovoid; minute serrations on most of basal 0.67-0.69 of outer margin, more strongly developed on distal area; minute spicules on apical 0.31-0.43 of outer and apical 0.08-0.15 of inner margins; midrib does not reach apex; seta 1-P moderately long, single; index 1.41-1.67, average 1.57.

LARVA. Chaetotaxy as recorded in Table 22. *Head*. Seta 4-C with 4-8 branches; 5-C triple; 6-C single to triple; 7-C with 7-11 branches; 12-C with 4-8 branches; dorsomentum with 39-40 teeth. *Antenna*. Moderately long, moderately pigmented, with a number of small scattered spicules; seta 1-A triple to 5 branched, moderately long; 2-A long, with a subapical constriction; 3-A short, 0.27-0.33 length of 2-A; 4-A moderately long, 0.44-0.61 length of 2-A; 6-A short, 0.22-0.30 length of 2-A. *Abdomen*. Seta 1-VIII triple to 5 branched; 3-VIII triple to 6 branched; 5-VIII with 5-8 branches; 2-X with 5-7 branches; ventral brush with 15-18 setae on grid and 3-4 precratal shorter ones, all multiple branched; saddle moderately pigmented, incompletely rings segment X, acus absent; 4 moderately long anal papillae; comb with 8-12 (usually 12) scales arranged in a single curved irregular row, each scale with a stout median apical spine and small denticles on lateral areas. *Siphon*. Moderately pigmented; acus well developed; index 1.77-2.33, average 1.97; pecten on basal 0.64-0.68 of siphon, composed of 12-16 (usually 14) teeth, apical 2-3 teeth longer and wider spaced than remainder of teeth, each tooth with 1-2 small stout ventral denticles near base; seta 1-S short, 5-8 branched, base attached on basal 0.71-0.74 of siphon distad of last pecten tooth.

DISCUSSION. *Aedes latipennis* belongs to the *uncus* Group of species (see discussion under *uncus*). The male and female genitalia are very distinctive and readily separated from the other species of the group and subgenus. The paraproct of the male genitalia is unusually developed and is long, broad, flat and with 2-3 long setae. The female genitalia have sternum VIII with latero-apical lobes which is distinctive and unusual for the subgenus. The larvae are easily separated from other members of the subgenus in the development of the ventral brush of segment X which has 15-18 setae on the grid and 3-4 precratal setae. The larva and pupa are fully described above.

TYPE-DATA. The type-data of the holotype of *latipennis*, taken from the collection data sheet, are amended as follows: male with associated pupal and larval skins, THAILAND, *Songkhla*, Amphoe Haad Yai, 2 km from weather station below Ton Nga Waterfalls, 26 March 1965, E. L. Peyton collector, collection number SL-84-11, collected as a larva from water in a large temporary flood pool in a rocky depression near a stream, in partial shade, at an altitude near 250 feet, and in a primary forest. The allotype and paratypes with same data as holotype except collection numbers which are in SL-82 series. The paratype male also has a collection number of SL-84 and is from the holotype locality and not from *Nakhon Si Thammarat*.

DISTRIBUTION. 22 specimens examined: 4♀, 2♂, 6 L, 5 with associated pupal and larval skins.

THAILAND. *Prachin Buri*, Ban Bu Phram; 2♀ pl, 1 L. *Songkhla*, Amphoe Haad Yai, Ton Nga Waterfalls; 1♂ pl (holotype), 1♀ pl (allotype), 1♀ pl and 1 ♂ (paratypes), 5 L.

BIOLOGY. Larvae were collected from a small ground pool and from a large flood pool in a rocky depression near a stream; from clear, fresh, unmoving, temporary water in partial shade; once in a primary forest and once in a secondary scrub area in a valley; and at elevations from 76-150 m.

AEDES (VERRALLINA) LEICESTERI EDWARDS

(Figs. 14, 42, 56, 61)

FEMALE. *Head*. Antenna dark brown, 0.96-1.01 length of proboscis, pedicel brown with a few small brown scales and short fine hairs mesally, flagellomere 1 with basal 0.4 pale and with several small brown scales near middle; clypeus dark brown, bare; maxillary palpus blackish-brown scaled, 4 segmented, 0.14-0.15 length of proboscis; proboscis blackish-brown scaled, 1.14-1.17 length of femur I; eyes nearly contiguous in front; ocular setae dark brown and well developed; scales on head all broad and decumbent except for a double row of narrow curved white scales along coronal suture, a few similar ones on occiput and occiput with a patch of dark brown erect forked scales; vertex blackish-brown scaled; lateral surface blackish-brown scaled with a narrow stripe of white scales extending from area in front of antepronotum to ocular line; occiput with a few broad white scales mixed with narrow scales. *Thorax*. Scutal integument brown; scutum covered with narrow curved reddish-black scales except for a small patch of narrow curved white scales on median anterior promontory area and anterior scutal fossal area; prescutal space mostly bare, however, with a small median cephalad patch of narrow curved dark scales; scutellum with a patch of narrow curved reddish-black scales on each lobe; dark reddish-black setae on the following areas: 4-5 median anterior promontory, numerous acrostichal (anterior and posterior), numerous dorsocentral (anterior and posterior), scutal fossal (4-7 anterior, 3-6 lateral and 1-2 posterior), numerous supra-alar, 6 posterior medial scutal, 1 postalar callar and scutellar (5-7 long and 4-5 short ones on lateral lobe, 5-6 long and 4-6 short ones on median lobe); pleural integument brown; antepronota widely separated, scales absent, 10-14 dark setae; postpronotum with narrow curved reddish-black scales on upper area, 5-7 dark posterior setae and a patch of short fine hairs cephalad of setae; propleuron with a patch of broad white scales, 15-19 brown setae; prosternum, subspiracular area, paratergite, mesomeron and metameron bare; postspiracular area without scales, 5-8 dark setae; mesepisternum with a large upper patch of broad pale scales with a brown hue and a small lower posterior patch of broad white scales, 4-7 upper and 15-19 posterior setae, a patch of short fine hairs cephalad of upper scale patch near subspiracular area; prealar knob without scales, 14-19 dark setae; mesepimeron with a patch of broad white scales near center, 27-29 setae dorsad of scale patch, numerous fine golden hairs cephalad of scale patch and extending to near lower margin of sclerite. *Legs*. Coxae I-III each with several setae, I with broad brown scales and a small dorsal patch of white ones on anterior surface, II and III each with a patch of broad white scales on anterior area; trochanters I-III each with broad pale scales; femora I and II with anterior surfaces brown scaled, II also with a longitudinal stripe of pale scales on anteroventral area, I and II with posterior surfaces brown scaled with a longitudinal white scaled stripe, stripe dorsal on I and ventral on II, III dark brown scaled with an anteroventral and a posteroventral stripe of white scales, stripe broad at base and narrower apically; tibiae I-III each brown scaled, I with a posteroventral longitudinal white scaled stripe from base to apex, II with posterior surface white scaled; tarsi I-III brown scaled; posttarsi I-III (Fig. 61) each with 2 ungues, I and II with ungues equal, each with a tooth, III with ungues equal, both simple. *Wing*. Dorsal and ventral veins with dark brown scales; alula with several moderately broad dark brown scales on margin; upper calypter with several setae on margin; 1 remigial seta. *Halter*. Pedicel pale; capitellum dark brown scaled. *Abdomen*. Terga blackish-brown scaled, laterotergite of I with a rectangular patch of broad white scales, II-VII each with a large laterobasal patch of broad white scales, patches extend onto dorsolateral areas of V-VII; sterna white scaled each with a narrow apical band of broad brown scales, VIII brown scaled; terga and sterna with numerous golden or brown setae, mostly along posterior margins. *Genitalia* (Fig. 14). Tergum VIII moderately pigmented, wide, base very slightly concave, apex slightly convex, a number of short, moderately long and long setae at apex, a number of setae stout, several short and moderately long setae on apical 0.33-0.42, basolateral seta absent, covered with minute spicules, numerous broad scales on apical 0.68-0.76, basal 0.40-0.45 retracted into segment VII, VIII-Te index 0.48-0.50, VIII-Te/IX-Te index 3.97-4.17; sternum VIII moderately pigmented, wide, base slightly concave mesally, apex with a shallow median indentation with a small lobe on each side of midline, numerous moderately long and short setae apically, more numerous and slightly stouter on apical lobes, numerous short and a few moderately long setae scattered over apical 0.88-0.91, covered with minute spicules, numerous broad scales covering most of apical 0.68-0.76, apical intersegmental fold unpigmented, VIII-S index 0.62-0.67; tergum IX moderately pigmented, wide, base concave mesally, setae absent, covered with minute spicules, index 0.19-0.20; insula unpigmented, short, covered with minute spicules, 4-6 small tuberculi, each with a minute spicule; lower vaginal lip heavily pigmented, narrow, a few spicules on hinge area, with a small caudally projected moderately pigmented median apodeme, lower vaginal sclerite broad with a moderately deep median apical indentation and usually 1-3 small holes along distal portion of midline, base with a small median indentation; upper vaginal lip heavily pigmented, moderately broad, posterolateral areas rounded, median posterior area formed into a large upright shield caudad of spermathecal eminence, upper vaginal sclerite heavily pigmented, large, complex, forms a band from upper vaginal lip to and caudad of spermathecal eminence; spermathecal eminence heavily pigmented, large, somewhat diamond-shaped in dorsal outline, ventral outline heart-shaped, spiny excrescences, short, with lateral projections and along laterobasal and basal areas; postgenital lobe short, moderately broad, apex with a small median indentation, 11-19 setae on each side of midline, completely covered with minute spicules, dorsal PGL index 0.6-0.7, ventral PGL index 0.88-1.03; peri-anal membrane with minute spicules; cercus triangular in shape, moderately long, broad at base, apex acute, completely covered with small spicules, dorsal surface with a number of moderately long and a few short setae scattered over apical 0.89-0.92, 2 longer ones at apex, ventral surface with several short and a few moderately long setae on outer 0.4-0.5, 1-6 broad scales on dorsal surface, cercus index 2.40-2.79, cercus/dorsal PGL index 4.04-4.54; 3 seminal capsules, 1 large, 1 medium and 1 small in size, heavily pigmented, spherical, each with a broad neck, several seminal capsule pores near orifice, base of accessory gland duct lightly pigmented.

MALE. Similar to female in general habitus but with the following differences. *Head.* Antenna plumose, 0.81-0.88 length of proboscis; maxillary palpus 0.12-0.14 length of proboscis; proboscis 1.04-1.16 length of femur I. *Thorax.* Antepronotum with 8-12 setae; prealar knob with 8-14 setae; mesepimeron with 18-24 setae dorsad of scale patch. *Legs.* Posttarsi I-III (Fig. 56) each with 2 ungues, I and II with ungues unequal, larger ungue of each with a tooth, III with ungues equal, both simple. *Abdomen.* Tergum VIII brown scaled with a laterobasal patch of broad white scales. *Genitalia.* As figured by Delfinado (1968, Fig. 8).

PUPA (Fig. 42). Chaetotaxy as figured and recorded in Table 10. Ocular plate with moderately developed cuticular facets. *Respiratory trumpet.* Heavily pigmented; hair-like spicules on distal 0.75-0.77 of inner surface; index 2.95-3.60, average 3.2. *Abdomen.* Setae 6, 9-VII weakly developed; 4-VIII double to 5 branched; 9-VIII single. *Paddle.* Ovoid; minute serrations on most of basal 0.70-0.72 of outer margin; minute spicules on apical 0.28-0.30 of outer and apical 0.19-0.24 of inner margins; midrib does not reach apex; seta 1-P moderately long, single or double; index 1.37-1.50, average 1.42.

LARVA (Fig. 56). Chaetotaxy as figured and recorded in Table 23. *Head.* Seta 4-C with 5-7 branches; 5-C triple; 6-C missing on all specimens; 7-C with 8-12 branches; 12-C triple to 7 branched; dorsomentum with 35 teeth. *Antenna.* Moderately long, moderately pigmented, with several scattered small spicules, more numerous on basal area; seta 1-A with 4-5 branches, moderately long, branches thickened; 2-A long, with a subapical constriction; 3-A short, 0.19-0.23 length of 2-A; 4-A moderately long, 0.42-0.47 length of 2-A; 6-A short, 0.29-0.32 length of 2-A. *Abdomen.* Setae 1, 2-VIII on small common basal plate; 1-VIII with 5-7 branches; 3-VIII with 8-10 branches; 5-VIII with 7-13 branches; 2-X with 6-8 branches, each approximately equal in length; ventral brush with 10-11 setae on grid and 2 precratal shorter ones, all multiple branched; saddle moderately pigmented, incompletely rings segment X, acus absent; 4 moderately long anal papillae; comb with 8-12 (usually 10) scales arranged in a single curved irregular row, each scale with a stout median apical spine and small denticles on laterobasal areas. *Siphon.* Moderately pigmented; acus well developed; index 2.21-2.47, average 2.31; pecten on basal 0.58-0.63 of siphon, composed of 11-15 (usually 14) teeth, apical 2-4 teeth longer and wider spaced than remainder of teeth, each tooth long, slender and with 1-2 small stout ventral denticles near base; seta 1-S short, with 5-10 branches, base attached on basal 0.65-0.71 of siphon distad of last pecten tooth.

DISCUSSION. *Aedes leicesteri* belongs to the *uncus* Group of species. The adults are very similar to the other members of the group in habitus features and therefore can not be distinguished from them with certainty. The female and male genitalia of *leicesteri,* however, are quite distinctive and easily separated from the other members of the group and subgenus. The shape of the lower vaginal sclerite of the female genitalia and the development of the gonocoxite projections and gonostylus of the male genitalia are the most striking differences from the other species of the group.

Pupae of this species are very similar to the other members of the group. The larvae are also similar to the other species of the *uncus* Group but differ in the very long anal papillae and the shortness of antennal seta 3-A.

The female, female genitalia, pupa and larva are described and illustrated for the first time. Male posttarsi are illustrated for the first time and additional information on the adult male is presented.

DISTRIBUTION. 30 specimens examined: 6♀, 8♂, 10 with associated skins (4 p, 6 l).

MALAYSIA. *Selangor,* Templer Park; 5♀ pl, 1♀ p, 1♂ pl, 3♂ p, 3♂; Kuala Lumpur, Ampang jungle; 1♂ (holotype).

BIOLOGY. Immatures were collected in Malaysia from small ground pools containing clear, fresh, unmoving, temporary water in heavily shaded areas located in a secondary rain forest in hilly terrain and at an elevation of 152 m.

AEDES (VERRALLINA) LUGUBRIS BARRAUD
(Figs. 23, 43, 61)

PUPA (Fig. 43). Chaetotaxy as figured and recorded in Table 11. The description and table are based on 5 skins and represent the first description of the pupa of this species. Cephalothorax and abdominal segments with heavily pigmented areas. *Respiratory trumpet.* Moderately pigmented; index 4.75-5.67, average 5.11. *Abdomen.* Setae 6, 9-VII weakly developed; 4-VIII double or triple; 9-VIII triple to 6 branched. *Paddle.* Ovoid; minute serrations on distal portion of basal 0.49 of outer margin; minute spicules on apical 0.51 of outer and apical 0.32 of inner margins; midrib reaches apex, however, apical portion lightly pigmented; seta 1-P moderately long, single or double; index 1.20-1.36, average 1.27.

DISCUSSION. See discussion section of *butleri.*

The description and illustration of *butleri* male genitalia by Edwards *in* Barraud (1934: 296) belong to *lugubris,* however, the description of the female was attributed to the correct species.

The posttarsi (Fig. 61) and tergum IX (Fig. 23) of the female of *lugubris* are illustrated for the first time.

DISTRIBUTION. 15 specimens examined: 6♀, 4♂, 1p, 4 with associated pupal skins.

MALAYSIA. *Selangor,* Kuala Selangor, Rantau Panjang; 3♀ p, 2♀, 1♂ p, 3♂, 1 p.

THAILAND. *Trat*(?); 1♀ (one female with genitalia preparation containing the following data: STM-1-A, Sept. 1963, Thailand, probably Trat Province).

BIOLOGY. In Malaysia pupae were collected from fresh, colored, unmoving water in small marshy depressions, in a partially shaded area located in a coconut orchard. Females in this country were collected biting man.

AEDES (VERRALLINA) MACRODIXOA DYAR AND SHANNON
(Figs. 23, 59, 61)

DISCUSSION. For a discussion of *macrodixoa* and comparison with *neomacrodixoa* see Laffoon (1946: 238) and King and Hoogstraal (1947: 124).

Illustrations are presented for the first time of the tarsomeres 5 and posttarsi of the male (Fig. 59) and the female (Fig. 61) and tergum IX of the female genitalia (Fig. 23).

DISTRIBUTION. 29 specimens examined: 19♀, 10♂.

PHILIPPINES. *Leyte,* Tacloban; 3♀, 3♂. *Luzon,* Tayabas, Infanta; 1♂ (holotype). *Mindanao,* Kabakan, Mercedes, Parang (Ludlow Barracks); 13♀, 3♂. *Mindoro,* San Jose; 3♀, 3♂.

BIOLOGY. Immatures have been collected from rain pools and adults collected resting in military foxholes.

AEDES (VERRALLINA) MARGARSEN DYAR AND SHANNON
(Figs. 22, 23, 25, 59)

DISCUSSION. *Aedes margarsen* belongs to the *andamanensis* Group of species. It is very similar to *johnsoni* and is discussed under that species. Adults are, however, readily distinguished from *johnsoni* by the presence of setae on the upper mesal area of the prosternum (Fig. 22) while these are absent in *johnsoni*.

Tergum IX of the female genitalia (Fig. 23), basal mesal lobe of the male genitalia (Fig. 25) and tarsomeres 5 and posttarsi of the male (Fig. 59) are illustrated for the first time.

A label on the lectotype male gives the genitalia preparation as slide 36. IX. 10d. This information had not previously been published.

DISTRIBUTION. 192 specimens examined: 72♀, 61♂, 29 individual rearings with pupal and larval skins.

PHILIPPINES. *Luzon Island,* Camp Eldridge, 1♂ (lectotype) and 4♀ and 3♂ (paratypes); *La Union,* Anastacio, 8♀, 8♂; *Zambales,* Subic Bay, 2♀, 1♂; Clark Air Force Base (?), 21♀ pl, 8♂ pl, 6♂ (Cl 337, Baisas). *Mindoro,* Kabakan, 13♀, 9♂; San Jose, 1♀, 1♂; San Ramon, 1♀, 1♂.

The following specimens are from the paratype series of *johnsoni* but belong to *margarsen.*

PHILIPPINES. *Basilan Island,* Isabela, 3♂. *Leyte,* Tanauan, 2♀. *Mindanao,* Pasanonco, 18♀, 6♂; San Ramon, 3♀, 12♂; Zamboaga, 2♂.

All the above specimens are in the USNM.

AEDES (VERRALLINA) NEOMACRODIXOA KING AND HOOGSTRAAL
(Figs. 23, 61)

DISCUSSION. Belkin (1962: 422, Fig. 294) described and illustrated, from 4 whole larvae, what he termed an undetermined species and subgenus of *Aedes* from Bougainville, Solomon Islands. After examining the above specimens (kindly loaned to me by Dr. John N. Belkin) and comparing them with a larval skin of *Aedes neomacrodixoa* from Papua, New Guinea, I found the 2 to be conspecific. Label information on these 4 larvae is as follows: Bougainville, Solomon Is., May 10, 1944, A. B. Gurney, 372, Ground pools, *Aedes* (?) sp. 1 det. J. N. Belkin. This record extends the northeastern range of *neomacrodixa* to the Solomon Islands. Belkin in his discussion of the above species stated the larvae possessed some features of species in the subgenera *Verrallina* and *Aedimorphus* but they could not be placed in any recognized subgenus. Several circumstances probably prevented Belkin from recognizing that his larvae belonged to the subgenus *Verrallina*, they are: (1) his study included only species in Section A, Series I (*neomacrodixoa* belongs to Section A, Series III), (2) larvae of *neomacrodixa* were not described until later (Huang 1968: 42), and (3) many species of the subgenus had the immatures unknown.

Sloof (1972: 178) also reported larvae of this species from Sipozae Island, Choiseul, Solomon Islands.

Tergum IX (Fig. 23) of the female genitalia and female posttarsi (Fig. 61) are illustrated for the first time.

DISTRIBUTION. 56 specimens examined; 21♀, 28♂, 4 L, 2 with associated skins (1 p, 1 l).

AUSTRALIA (Trust Territories). *New Guinea, Northeast,* Gusika, Finschhafen area; 13♀ and 15♂ (paratypes), 2♀, 3♂. *Papua*, Vanapa River, Port Moresby; 1♂ pl, 1♂ p. *Solomon Islands*, Bougainville; 4 L.

INDONESIA. *Celebes*, Kalawara; 1♀, 2♂. *Ceram*, Noehoehai, Wahaai, Warasiwa; 4♀, 4♂. *New Guinea, West Irian,* Hollandia, 1♂ (holotype), Cyclops Mountains, Hollandia area, 1♀ and 1♂ (paratypes).

BIOLOGY. A larva from Ceram was collected from a pool located in a virgin forest.

AEDES (VERRALLINA) NIGROTARSIS (LUDLOW)
(Figs. 3, 59, 61)

DISCUSSION. A discrepancy was noted between the descriptions and illustrations of the lower vaginal sclerites of the female genitalia of *nigrotarsis* as given by Laffoon (1946) and Delfinado (1968). After examining the holotype genitalia in the USNM it was apparent Laffoon's account was correct. A dessciption and illustration (Fig. 3) of this structure from the holotype follows. The lower vaginal sclerites consists of a large heavily pigmented sclerite with granular appearance and a median apical jagged indentation, attached basally to cephalic margin of upper vaginal sclerite, and a pair of small moderately pigmented, sigmoid shaped apical sclerites. The single male from Calicoan Island, Philippines, reported by Delfinado (1968: 29) is a species of the subgenus *Lorrania* Belkin.

Tarsomeres 5 and posttarsi of the male (Fig. 59) and the female (Fig. 61) are illustrated for the first time.

DISTRIBUTION. 86 specimens examined: 46♀, 40♂.

PHILIPPINES. *Leyte*, Abuyog, Jinamic Island, Leyte Gulf area, Tacloban;

8♀, 17♂. *Luzon, Rizal,* Camp Nichols, Clark Airforce Base, Infanta, Manila, Subic Bay, Wack-Wack; 26♀, 13♂. *Mindanao,* San Ramon, Zamboanga; 22♀, 5♂. *Samar,* Osmena; 6♀, 4♂.

SOUTH VIETNAM. *Binh Dinh,* An Khe; 2♀, 1♂ (these 3 specimens are in the USNM and represent the first country record for *nigrotarsis* outside the Philippines).

BIOLOGY. In the Philippines immatures were collected from water in grassy, temporary, ground pools and adults were taken in light traps and at a light in a military tent. Adults were collected in light traps in South Vietnam.

AEDES (VERRALLINA) NOBUKONIS YAMADA
(Figs. 22, 61)

Aedes (*Aedes*) *ishigakiensis* Bohart, 1956. Bull. Brooklyn Entomol. Soc. 51: 32 (♂*, ♀*, P, L*). NEW SYNONYM.

The following information based on the types of *nobukonis* and *ishigakiensis* supplements the descriptions of Yamada (1932), Sasa (1949), La Casse and Yamaguti (1950), Bohart (1956) and Delfinado (1968).

FEMALE. *Head.* Antenna 1.11-1.12 length of proboscis; maxillary palpus 0.15-0.17 length of proboscis; proboscis 0.97-0.98 length of femur I; eyes separated in front with white scales on interocular space. *Thorax.* Following setae present: 2 median anterior promontory; numerous acrostichal (anterior and posterior); numerous dorsocentral (anterior and posterior); scutal fossal (3-4 anterior, 4-7 lateral, 1 median and 1 posterior); numerous supra-alar; 4-6 posterior medial scutal; 1 postalar callar; scutellar (3-6 long and 4-5 short ones on lateral lobe, 4-5 long and 3-5 short ones on median lobe); 7-9 antepronotal; 3-4 postpronotal; 7-10 propleural; 2-4 postspiracular; 3 upper and 6-10 posterior mesepisternal, lower ones shorter; 6-11 on prealar knob; and mesepimeron with 6-9 dorsad of scale patch. Prosternum, subspiracular area, paratergite, mesomeron and metameron bare. Postspiracular area with a few broad white scales (rubbed off in several specimens). *Genitalia* (Fig. 22). As illustrated.

MALE. *Head.* Antenna plumose, 1.1 length of proboscis; maxillary palpus 0.17 length of proboscis; proboscis 1.04 length of femur I.

EGG. The following account of the egg is taken from Moriya et al. (1973: 52, 54). The egg chorion has a surface sculpturing consisting of a net-like pattern of cells. Each cell has a diameter of about 10 microns and under higher magnification is composed of 5-10 convex structures, each of which also has a net-like sculpturing. The authors give a scanning electron microphotograph of the surface sculpturing of the egg (page 52).

DISCUSSION. Male and female paratypes of *ishigakiensis* were kindly compared for me by Dr. Kazuo Tanaka with 5 syntype specimens (one male without apical abdomenal segments and genitalia and 4 females) of *nobukonis*. Dr. Tanaka also compared *ishigakiensis* with several males and females of *nobukonis* in Dr. Manabu Sasa's collection. No differences were detected between the 2 species and I am therefore considering them to be conspecific.

La Casse and Yamaguti (1950: 102) mistakenly reported pale broad scales on the paratergite.

Aedes nobukonis is easily separated from the other members of Section B by the distinctive male and female genitalia (Fig. 22) and in the adult from all species except *yusafi* (see Reinert 1973b) by the presence of white scales on the postspiracular area. *Aedes yusafi* differs from this species by the very large laterobasal white scaled patches on the abdominal terga and 5-8 posterior pronotal setae compared to the small white patches and 3-4 posterior pronotal setae in *nobukonis*.

Tarsomeres 5 and posttarsi of the female are illustrated (Fig. 61) for the first time.

DISTRIBUTION. 44 specimens examined: 12♀, 4♂, 6 p, 10 l, 12 L.

JAPAN. *Ryukyu Islands*, Ishigaki Island, Mt. Banna; 1♂ (holotype of *ishigakiensis*), 12♀, 3♂, 6 p, 10 l, 12 L (paratypes of *ishigakiensis*).

Tanaka (1971: 4) recently recorded this species from Sakishima Gunto in the Ryukyu Islands.

AEDES (VERRALLINA) NOTABILIS DELFINADO
(Figs. 13, 61)

The following information supplements the original description of Delfinado (1967: 28).

FEMALE. *Thorax*. Antepronotum with 14-18 dark setae; postpronotum with numerous narrow curved reddish-brown scales on upper area, 4-6 dark posterior setae; propleuron with broad white scales, 13-15 setae; prosternum, subspiracular area, paratergite, mesomeron and metameron bare; postspiracular area with 4-6 brown setae; mesepisternum with an upper and a lower patch of broad pale scales, 4-5 upper and several posterior setae; prealar knob with 9-12 dark setae; mesepimeron with a moderately large patch of broad white scales near center, 14-19 setae dorsad of scale patch, 7-11 hairs caudad of scale patch. *Legs*. Femora I and II each with anterior surface brown scaled, I and II each with posterior surface brown scaled with a broad white scaled longitudinal stripe on basal 0.9, I with stripe dorsal and II with stripe ventral, III white scaled with a narrow dorsal brown scaled longitudinal stripe on anterior and posterior surfaces from base to apex, stripe broader distally and rings apical 0.1; tibiae I-III each brown scaled, I and II each also with an indistinct posteriomedian white scaled longitudinal stripe; tarsi I-III each brown scaled; posttarsi I and II (Fig. 61) each with 2 ungues, equal in size, each with a tooth, III of all specimens missing. *Abdomen*. Terga each brown scaled with a large laterobasal white scaled patch which extends slightly on to tergum; sterna each white scaled with a narrow apical brown scaled band. *Genitalia* (Fig. 13). Insula with 4 small tuberculi; lower vaginal lip heavily pigmented and covered with small hair-like spicules; lower vaginal sclerite composed of a pair of moderately pigmented ovoid plates with spicules (illustrated here for the first time); and tergum IX wide, short and ribbon-like, index 0.24. Shape of spermathecal eminence distinctive for *notabilis*.

DISCUSSION. The holotype data are amended as follows: THAILAND, *Chon Buri*, Amphoe Bang Lamung, Khao Mai Keo, 7 October 1963, collection number CL-1, collector Kol Mongkolpanya, genitalia preparation number 30. iv.66, USNM type catalog number 69214, collected in a human biting collection. The above information is taken from the collection data sheet and adult labels.

Posttarsus III of all 4 specimens examined was missing but probably consists of 2 ungues which are equal in size and simple. Delfinado (1967: 28) mistakenly reported the holotype posttarsus III was composed of 2 ungues which were equal in size and each with a tooth. The holotype has all legs broken off except the femur and tibia of the left hindleg; however, most of the parts from the fore- and midlegs are glued to the paper specimen point. The right foreleg is glued on the paper point, under the specimen, near the normal position of the hindleg (both ungues equal in size and with a tooth) and could have been mistaken by Delfinado for the hindleg; however, the femur and tibia are marked as the foreleg in the above description (taken from the additional specimens). The sterna are also ornamented differently than the original description (see above).

The 2 basal hairy lobed structures of the postatrial plate of Delfinado (1967: 28, Fig. 18) are the basal portion of the lower vaginal lip. This structure in Delfinado's holotype preparation is somewhat damaged. The lower vaginal lip, lower vaginal sclerites, terga VIII and IX and sternum VIII are illustrated (Fig. 13).

DISTRIBUTION. 4 specimens examined: 4♀.

THAILAND. *Chon Buri,* Amphoe Bang Lamung, Khao Mai Keo; 1♀ (holotype), 2♀. *Nakhon Si Thammarat,* Amphoe Chawang, Nabon, Ban Tha Phea; 1♀.

BIOLOGY. The holotype and 2 other females were taken in daytime human biting collections. One female was collected from a light trap in a forest containing light vegetation.

AEDES (VERRALLINA) PAHANGI DELFINADO

(Fig. 22)

DISCUSSION. The female genitalia of *pahangi* are similar to those of *abditus*. These 2 species can be separated by the development of the median portion of the upper vaginal lip, shape of tergum IX and the wrinkled appearance of the seminal capsules in *pahangi.*

The median area of the upper vaginal lip and tergum IX of the female genitalia are illustrated (Fig. 22), the latter structure for the first time. These structures are compared to those of the other members of Section B (Figs. 21 and 22).

DISTRIBUTION. 3 specimens examined: 3♀.

MALAYSIA. *Pahang,* Kuala Terenggan; 1♀ (holotype), 1♀ (paratype). *Selangor,* Templer Park; 1♀.

BIOLOGY. One female in Malaysia was collected from a biting collection on a clear day, in a heavily shaded area of a secondary rain forest in a valley, on 3 February 1970 at 1300-1400 hours and at an elevation of 152 m.

AEDES (VERRALLINA) PANAYENSIS LUDLOW

(Figs. 25, 59)

DISCUSSION. Delfinado (1968: 32) recorded this species from Leyte (2 males which are *butleri* and 2 females which could not be located) and Puerto Princesa, Palawan (4 females which are *butleri* and one female which could not be found), but these records were based on misidentifications as indicated by the correct determinations included in the parentheses. Laffoon (1946: 242) selected a lectotype for this species and gives information about the type-series.

Female genitalia (Fig. 25) of *panayensis* are similar to those of *incertus* and *rarus* (see discussion of *rarus*).

Tarsomeres 5 and posttarsi of the male are illustrated (Fig. 59).

DISTRIBUTION. 202 specimens examined: 148♀, 54♂.

INDONESIA. *Alor*, Kalabahi; 1♀. *Celebes*; 1♂. *Ceram*, Piroe; 1♀, 2♂. *Kalimantan,* Poeroek Tjahoe; 1♀. *Moluccas,* Morotai Island, Point Gila; Poepliara, Regoha; 4♀. *New Guinea*, Schouten Islands, Aeoki Island in

Padaido Group; 24♀, 1♂.

MALAYSIA. *Sabah*, Kuala Penyu, Tawau, Semporna; 9♀, 5♂.

PHILIPPINES. *Basbas Island*; 4♀. *Mindanao*, Zamboanga; 1♀. *Palawan*, Balabac Island, Cape Melville; 1♀, 1♂, Culion Island, San Pedro; 1♀, 2♂. *Panay*, Iloilo; 29♀ and 20♂ (paratypes), 1♂ (lectotype), 2♀, 1♂. *Samar*, Calicoan Island; 1♂. Philippine Islands, no locality given; 8♀, 4♂.

There are 62 females and 15 males in the USNM with the following label information: Jola Jola, P.I., Maj. Ewing Coll., Thru Miss Ludlow. These specimens were apparently incorrectly labeled according to Laffoon (1946: 243).

BIOLOGY. The specimens from Malaysia were reared from immatures whose exuviae were apparently lost. These immatures were collected from a small ground pool containing clear, fresh, unmoving temporary water in an unshaded area located in a coastal village at sea level and with coconut palms.

Females from Malaysia were collected from a biting collection on a clear day, in a partially shaded area of a secondary rain forest in a plain terrain, on 1 June 1970 at 1030-1100 hours and at an elevation of 15 m.

AEDES (VERRALLINA) PETROELEPHANTUS WIJESUNDARA

(Fig. 15)

The following information is based on the lectotype female and 2 paralectotype females and supplements the brief description of Wijesundara (1951: 176).

FEMALE. *Head*. Antennal pedicel with a few small brown scales and short fine brown hairs mesally; vertex with a few narrow curved white scales along coronal suture; eyes contiguous in front. *Thorax*. Scutum covered with narrow curved reddish-brown scales except for small patches of narrow curved white scales on median anterior promontory and anterior scutal fossal areas; scutellum with narrow curved reddish-brown scales on each lobe; prescutellar space bare; numerous anterior and posterior acrostichal and dorsocentral setae; antepronotum with scales absent, 19-21 brown setae; postpronotum with narrow curved reddish-brown scales on upper area, 6 brown posterior setae; propleuron with a patch of broad white scales, 19-20 brown setae; prosternum, subspiracular area, paratergite, mesomeron and metameron bare; postspiracular area with scales absent, 4-5 brown setae; mesepisternum with a large upper and a smaller lower patch of broad white scales, 5-6 upper and 13-14 posterior setae, lower ones shorter; mesepimeron with a large patch of broad white scales near center, 20-21 setae dorsad of scale patch, several small golden-brown hairs along posterior margin and lower posterior corner of scale patch. *Genitalia* (Fig. 15). Spermathecal eminence and lower vaginal sclerites with characteristic shapes.

DISCUSSION. Wijesundara (1951: 176) described *petroelephantus* from 3 female cotypes which were later sent to the BMNH. Unfortunately these adult specimens, as well as other adult types in this shipment, were severely damaged in transit so that presently only fragments of the adults remain. The cotypes of this species are represented now by only 2 pinned specimens and 3 genitalia preparations (each in good condition and mounted in Canada balsam on a microscope slide). Lectotype designation is made for one of the cotype females with genitalia preparation and possesses the following label information: *Aëd.* (*Aëd.*) sp. new, Kurunegala, 16-12-22, Med. Entomologist, Ceylon, ♀ Hypo. No. 85, cotype, *Aëdes* (*Aëdes*) *petroelephantus* Wijesundara LECTOTYPE ♀, selected by J. F. Reinert, 10 July 1974. Paralectotypes are selected for the other 2 female cotypes which bear the same label data as the lectotype except for the genitalia preparation numbers--84 and 86. The adult of specimen No. 84 is lost and only the genitalia mount remains.

The adult of the lectotype is in very poor condition with only a twisted and rubbed thorax and head on a pin. The genitalia were dissected and remounted (10 July 1974) in Canada balsam and are in good condition.

AEDES (VERRALLINA) PHILIPPINENSIS DELFINADO

DISCUSSION. Delfinado (1968: 34) records the allotype female (with genitalia and tarsal claws on slides) deposited in the USNM. This type could not be located in neither the USNM nor SEAMP collections.

DISTRIBUTION. One additional female of *philippinensis* was found among unidentified *Aedes* in the USNM collection and at present represents the only specimen of this species in this collection. The specimen bears the following information on the labels: P. I., Leyte, Mahaplag, 11. VII. 64, Light trap, M. Delfinado collector, genitalia preparation number T73. 542, Det. J. F. Reinert.

AEDES (VERRALLINA) PHNOMUS KLEIN

DISCUSSION. The 2 female specimens recorded as *indicus* from Thailand by Delfinado (1967: 25) were incorrectly identified and are here provisionally assigned to *phnomus* (see taxonomic discussion section of *indicus*). Her Figure 18 also belongs to this species.

DISTRIBUTION. The following information was taken from the collection data sheets for the 2 Thailand specimens: 1♀, collection number U-72, THAILAND, *Nakhon Ratchasima*, Amphoe Muang, Pak Thong Chai, Nong Nam Keo, 30 May 1963, 1930-2000 hours, biting a buffalo and 1♀, collection number U-555, THAILAND, *Chon Buri*, Amphoe Bang La Mung, Khao Mai Kaeo, 14 August 1963, 1900-2000 hours, biting collection.

I have also examined the holotype of *phnomus* from Chrui Changwar, *Kandal*, CAMBODIA.

AEDES (VERRALLINA) PIPKINI BOHART
(Figs. 24, 61)

DISCUSSION. Bohart and Ingram (1946: 29) reported a single female *Aedes* from Truk but they were unable to identify it. I have compared this specimen with the holotype female and paratypes of *Aedes pipkini* and have determined it to be conspecific with them. The adult (genitalia mounted in Canada balsam on a slide) is in the USNM and contains the following information on the labels: Moen I., Truk, XI-28-45, caught resting in occupied tent at 0700, R. L. Ingram, 807.

Tergum IX of the female genitalia (Fig. 24) and female posttarsi (Fig. 61) are illustrated for the first time.

AEDES (VERRALLINA) PRIOEKANENSIS BRUG

(Fig. 25)

The following information based on the holotype and specimen number 18.220 supplements the descriptions of Brug (1931: 249) and Delfinado (1968: 34).

MALE. *Head* (head description taken from specimen number 18.220). Antenna brown, plumose, 1.0 length of proboscis, pedicel dark brown; clypeus dark brown, bare; maxillary palpus dark brown scaled, 0.11 length of proboscis; proboscis dark brown scaled, 1.23 length of femur I; eyes contiguous in front; ocular setae dark brown; scales on head broad, dark brown and decumbent except for a few narrow curved white scales along coronal suture, a small patch of broad white scales on lateral surface in front of antepronotum next to ocular line and a small patch of similar ones on postgena; occiput with several short brown erect forked scales and a few decumbent broad white scales. *Thorax*. Scutal integument reddish-brown; scutum covered with narrow curved reddish-brown scales except for a few narrow curved white scales on median anterior promontory area, anterior scutal fossal area, supra-alar area near base of wing, median anterior area of prescutellar space and on median lobe of scutellum (lateral lobes with narrow curved reddish-brown scales); dark brown setae on following areas: 2 median anterior promontory; numerous acrostical (anterior and posterior); numerous dorsocentral (anterior and posterior); scutal fossal (3 anterior, 2-3 lateral and 1 posterior); numerous supra-alar, 4 posterior medial scutal, 1 postalar callar and scutellar (3 long and 2-3 short ones on lateral lobe, 4 long and 3 short ones on median lobe); pleural integument dark brown; antepronotum with 7-8 brown setae; postpronotum with a few narrow curved reddish-brown scales dorsally, 3 brown posterior setae; propleuron with several broad white scales, 11-14 setae; prosternum, subspiracular area, paratergite, mesomeron and metameron bare; postspiracular area with 6 brown setae; mesepisternum damaged but with an upper and a lower patch of broad white scales, several setae; prealar knob with 7-8 brown setae; mesepimeron with a patch of broad white scales near center, 10-12 brown setae dorsad of scale patch, a few short fine golden hairs caudad of lower posterior corner of scale patch. *Legs*. Coxae I-III each with several brown setae, I with broad brown scales and a small dorsal patch of broad white scales on anterior surface, II and III each with a patch of broad white scales on anterior surface; trochanters I-III each with a few pale brown scales; femora I and II each with anterior surface brown scaled, posterior surface brown scaled with a longitudinal pale scaled stripe from base to near apex, stripe dorsal on I and ventral on II, III with anterior and posterior surfaces each mostly white scaled and with a dorsal brown scaled longitudinal stripe from base to apex forming a narrow apical brown scaled band; tibiae I-III and tarsi I-III brown scaled; posttarsi I-III each with 2 ungues, I and II each with ungues unequal, larger ungue with a tooth and smaller one simple, III with ungues equal, one ungue with a small tooth and other one simple. *Wing*. Dorsal and ventral veins with brown scales; alula badly rubbed in both specimens but specimen 18.220 with a few narrow brown scales on margin; upper calypter with several dark setae on margin. *Halter*. Pedicel pale; capitellum white scaled. *Abdomen*. Terga I-V each brown scaled with a small laterobasal patch of white scales (remainder of abdomen removed with genitalia); sterna brown scaled with pale basal scales; terga and sterna with numerous golden-brown setae, mostly along posterior margins. *Genitalia* (Fig. 25). Complete genitalia as illustrated by Delfinado (1968: Fig. 8).

DISCUSSION. *Aedes prioekanensis* male adults (females unknown) are very similar to those of *incertus* and *rarus*. The male genitalia of the 3 species are easily distinguishable by the development of the apical portion of the basal mesal lobe (*prioekanensis* has a thin seta, *incertus* has a thick spiniform seta, and *rarus* has a fleshy projection with a frayed apex). The gonocoxite of the male genitalia of *prioekanensis* and *incertus* also have an apicomesal projection while this projection is absent in *rarus*.

Posttarsus III of *prioekanensis* has 2 ungues which are equal in size and one with a small tooth which differs from the males of both *rarus* and *incertus* which have the ungues of posttarsi III simple. The presence of a tooth on the ungue of posttarsus III is very unusual for Section A but normal for Section B.

The abdominal terga of *prioekanensis* are brown scaled with small laterobasal white scaled patches and posttarsus III, which had previously been mounted, has ungues equal and only one with a small tooth. Delfinado (1968: 34) mistakenly reported the terga as wholly dark brown and both ungues of posttarsus III toothed.

TYPE-DATA. Adult holotype specimen bears labels with the following data: *Aedes* (*Aedes*) *dermajoensis*, n. sp.. VAR. *prioekanensis*, ♂ TYPE, Brug; 18.219 [collection number]; Sumatra: Benkulen, xi-xii. 1929, Col. S. L. Brug, B. M. 1930-511 [a BMNH printed label]; Larva in pool in virgin forest; SEAMP accession number 376; and genitalia preparation number T73. 562. Type deposited in the BMNH. Brug's field collection notes for this specimen record the following information: de Rook [collector], Dermajoe (Benkoelen), Nov.-Dec. 1929, 18.219 type Br. Mus., *Ae. prioekanensis*, 18.219-20 (2♂) [2 males from the collection]. Brug (1931: 249), however, reported the following in the original description of this species "Described from one specimen bred from a larva found in a swamp in a virgin forest near Air Prioekan." The second male, 18.220, recorded in Brug's field collection notes is also in the BMNH and bears the following information on the adult labels: 18.220; Co-type *Ae. prioekanensis*; and SEAMP accession number 30.

The holotype is in poor condition and is as follows: head and all appendages missing; pinned through pleura of thorax with a minuten pin; all legs on left side and right tarsus I mounted on a small celluloid point attached to pin; and left wing missing. Genitalia remounted in Canada balsam on a microscope slide from a celluoid point attached to pin. The specimen (18.220) labeled co-type has the head and its appendages in good condition.

DISTRIBUTION. 2 specimens examined: 2♂.

INDONESIA. *Sumatra*, Dermajoe (Benkoelen); 1♂ (holotype), 1♂.

AEDES (VERRALLINA) PSEUDOMEDIOFASCIATUS (THEOBALD)
(Figs. 16, 59, 61)

The following information supplements the descriptions of Theobald (1910: 489) and Barraud (1928: 367).

FEMALE. *Head*. Antenna 1.11-1.14 length of proboscis, pedicel with a few small brown scales and short fine hairs mesally; maxillary palpus 0.17-0.18 length of proboscis; proboscis 0.95-0.98 length of femur I. *Thorax*. Antepronotum with 9-16 dark setae, scales absent; postpronotum with narrow curved reddish-black scales on upper area, 5-7 dark posterior setae; propleuron with a patch of broad white scales, 10-12 dark setae; prosternum, subspiracular area, paratergite, mesomeron and metameron bare; postspiracular area without scales, 2-5 dark setae; mesepisternum with a large upper and a small lower patch of broad white scales, 4-5 upper and 8-10 posterior setae, lower ones shorter; mesepimeron with a large patch of broad white scales near center, 10-14 dark setae dorsad of scale patch, 3-5 short fine hairs near lower posterior corner of scale patch. *Abdomen.* Sterna white scaled each with a narrow apical band of brown scales. Genitalia (Fig. 16). As illustrated.

MALE. *Head.* Antenna 0.97-1.02 length of proboscis; maxillary palpus 0.10-0.13 length of proboscis; proboscis 1.03-1.14 length of femur I.

DISCUSSION. No consistent difference in adult habitus characters could be found between *pseudomediofasciatus* and *cautus*; however, marked differences exist between the genitalia of both females and males of the 2 species. These 2 species are also similar to *sabahensis*, new species, and can be separated from it by features of abdominal markings and the propleuron.

Tarsomeres 5 and posttarsi of the male (Fig. 59) and the female (Fig. 61) are illustrated for the first time.

DISTRIBUTION. 9 specimens examined: 4♀, 5♂.

SRI LANKA. *Central*, Kandy District, Peradeniya; 1♀. *North Central*, Anuradhapura District, Hunuwilagama, Wilpattu; 2♂. *Northern*, Vavuniya District, Parayanalankulan, 25 miles NW. of Medawachchiya; 2♀, 3♂. *Sabaragamuwa*, Ratnapura District, Uggalkaltota; 1♀.

BIOLOGY. Adults were collected at elevations of 30 and 60 m.

AEDES (VERRALLINA) PSEUDOVARIETAS NEW SPECIES
(Figs. 31, 59)

MALE. *Head.* Antenna plumose, brown, 0.96 length of proboscis, pedicel dark brown; clypeus dark brown, bare; maxillary palpus blackish-brown scaled, 0.12 length of proboscis; proboscis blackish-brown scaled, 1.15 length of femur I; eyes contiguous; ocular setae blackish-brown and well developed; scales on head all broad, blackish-brown and decumbent except for a few narrow curved white scales along coronal suture, a narrow stripe of broad white ones extending from area in front of antepronotum to ocular line, and a small patch of dark erect forked scales on occiput. *Thorax.* Scutal integument dark reddish-brown; scutum covered with narrow curved dark reddish-brown scales; prescutellar space bare except for a small median cephalad area of narrow curved scales; scutellum with a patch of narrow curved reddish-brown scales on each lobe; dark reddish-black setae on the following areas: 2 median anterior promontory, numerous acrostichal (anterior and posterior), numerous dorsocentral (anterior and posterior), scutal fossal (4 anterior and 3 lateral), numerous supra-alar, 4 posterior medial scutal, 1 postalar callar and scutellar (4 long and 2-3 short ones on lateral lobe, 4 long and 3 short ones on median lobe); pleural integument brown; antepronota widely separated, scales absent, 7 long and short dark setae; postpronotum with a few narrow curved reddish-brown scales on upper area, 3 posterior dark setae; propleuron with a patch of broad white scales, several setae; prosternum covered; subspiracular area, paratergite, mesomeron and metameron bare; postspiracular area within a fold of the pleuron and not visible; mesepisternum with a large upper and a small lower patch of broad white scales, 3 upper and 7 posterior setae; prealar knob without scales, 5-6 dark setae; mesepimeron with a patch of broad white scales near center, 5-6 setae dorsad of scale patch, 2-4 short fine hairs near lower posterior corner of scale patch. *Legs.* Coxae I-III each with several setae, I with broad brown scales and a small dorsal patch of broad white ones on anterior surface, II and III each with a patch of broad white scales on anterior surface; trochanters I-III each with a few pale brown scales; femora I and II each with anterior surface brown scaled, II also with an indistinct ventral longitudinal stripe of pale scales, posterior surfaces of I and II brown scaled with a longitudinal pale stripe, stripe dorsal on I and ventral on II, III with anterior and posterior surfaces brown scaled with a ventral longitudinal stripe of white scales, broader at base and tapering apically; tibiae I-III and tarsi I-III each dark brown scaled; posttarsi I-III (Fig. 59) each with 2 ungues, I and II each with ungues unequal, larger one with a tooth, smaller one simple, III with ungues equal, both simple. *Wing*. Dorsal and ventral veins with dark brown scales; alula with a few narrow brown scales on margin; upper calypter with several brown setae on margin; 1 remigial seta. *Halter*. Pedicel pale; capitellum dark brown scaled. *Abdomen*. Terga blackish-brown scaled, I-V each with a small laterobasal patch of white scales (remainder of abdomen removed with genitalia); sterna with basal areas pale scaled and apical areas brown scaled; terga and sterna with several setae, mostly along posterior margins. *Genitalia* (Fig. 31). Tergum IX moderately to heavily pigmented, band-like with lateral areas somewhat broader, outer caudal margin fused to tergum X, setae absent, broadly connected laterally to sternum IX; gonocoxite short, broad, heavily pigmented, mesal surface membranous with minute spicules, dorsal surface with apex extended into a long narrow pointed mesally curved arm with a moderately long stout seta near middle of dorsal area, a short heavily pigmented subapical spine also on dorsal surface, a long stout mesally curved seta at base of arm, a few moderately long and long setae on dorsal surface mainly along mesal margin of gonocoxite, ventral surface with a long flat broad heavily pigmented apical projection with a wrinkled and bluntly pointed apex, several moderately long setae and a few long stout ones mainly on mesal surface of gonocoxite, a few long setae on lateral surface, a number of broad scales on lower dorsal, lateral and most of ventral surfaces; gonostylus heavily pigmented, long, strongly curved near middle, apical 0.27 bifurcated, outer arm of furcation longer, 4-5 moderately long setae on mesal margin of area between median bend and furcation, gonostylus attached subapically on gonocoxite; basal mesal lobe moderately pigmented, consists of a broad basal area with 3 long heavily pigmented spiniforms (mesal one shorter than other 2) and a narrower apical extension on mesal area of gonocoxite which projects slightly past the apex and is covered with numerous short and moderately long thin setae, however, setae more numerous on basal area, covered with small spicules, lobe connected mesally with its mate by a moderately broad band which is covered with small spicules and is located ventrad of apical portion of prosophallus and phallus; proctiger with paraproct formed into a heavily pigmented long slender acuminate arm with a sharp bend near basal area, base with a short projection which extends ventrad and articulates at a point on the dorsomesal surface of the parameral apodeme near base of opisthophallus, base of proctiger lightly fused with tergum X, cercus membranous and without cercal setae; tergum X moderately pigmented, consists of a small indistinct plate laterad of paraproct base and extends ventrally from caudal margin of tergum IX; phallosome complex, opisthophallus--consists of a lightly to moderately pigmented tergal transverse bridge between parameral apodemes, caudal margin slightly indented mesally, sternobasal area attached to tergobasal portion of outer area of prosophallus, located dorsad of phallus and prosophallus and ventrad of proctiger, phallus--consists of a pair of moderately long, heavily pigmented, narrowly separated, caudally produced arms with apical area curved dorsad, arms fused together by a basal plate which extends laterally and is fused to basal portion of prosophallus, prosophallus--consists of a pair of moderately long widely separated arms with distal portion heavily pigmented and curved, proximal portion moderately pigmented and formed into a broadly rounded area which is attached to tergomesal portion of paramere, located laterad of phallus, prosophallic arm approximately equal in length to phallic arm, paramere--heavily pigmented, approximately equal in length to phallic arm, articulates at a point approximately 0.6 from base with caudal area of parameral apodeme, parameral apodeme--moderately to heavily pigmented, moderately long, outer surface broadly attached to tergobasal apodeme of gonocoxite; sternum IX heavily pigmented throughout, large, broad, lateroapical areas rounded, 18 short and moderately long setae in an elongate patch near caudal margin.

FEMALE, PUPA, LARVA AND EGG. Not known.

DISCUSSION. The adult male habitus of *pseudovarietas* and *varietas* are very similar and no consistent differences could be found with which to separate the 2 species. They do, however, occupy different geographical areas.

The male genitalia of the 2 species differ and are easily separated. The male genitalia of *pseudovarietas* differ most noticeably from those of *varietas* by the following features: shape of the ventroapical projection of the gonocoxite, development of the basal mesal lobe, and with fewer setae on sternum IX (compare Fig. 31 and Delfinado's 1968 Fig. 10).

TYPE-DATA. Holotype male (genitalia mounted on a slide in Canada balsam) with the following collection data: MALAYSIA, *Sabah*, Kudat, Matunggong, 30 April 1970, Samuel Wilson James and Chia Yiew Wang collectors, collection number S-697, genitalia preparation number 74/379, MEP accession number 409, collected as an adult on a clear day, among coconut trees in a village, in partial shade at 1100 hours and at an elevation of 61 m. Holotype is in good condition and is deposited in the USNM.

DISTRIBUTION. Known only from the type-locality.

BIOLOGY. As listed in the type-data.

AEDES (VERRALLINA) RAMALINGAMI NEW SPECIES
(Figs. 32, 59)

MALE. *Head.* Antenna with flagellomeres dark brown basally, plumose, 1.16 length of proboscis, pedicel pale brown; clypeus brown, bare; maxillary palpus dark brown scaled, 0.17-0.18 length of proboscis; proboscis dark brown scaled, 1.08-1.14 length of femur I; eyes separated in front; several long blackish-brown ocular setae; scales on head all broad, decumbent and dark brown except for a few broad white ones on ocular line and a patch of similar ones anterodorsally on lateral surface next to eye and at level with antepronotum, and a few short erect forked blackish-brown scales on occiput. *Thorax.* Scutal integument brown; scutum covered with narrow curved dark reddish-brown scales, scutellum with a few similar scales on each lobe; prescutellar space bare; blackish-brown setae on following areas: 4 median anterior promontory, several acrostichal (anterior and posterior), numerous dorsocentral (anterior and posterior), scutal fossal (2 anterior, 2 lateral and 1 posterior), numerous supraalar, 4 posterior medial scutal, 1 postalar callar and scutellar (3-4 long and 1 short on lateral lobe; 3-4 long and 1-2 short on median lobe); pleural integument pale brown; antepronotum with a few broad dusky-white scales, 7-8 dark brown setae; postpronotum with 3-4 dark brown setae; propleuron with a few broad white scales, 4-6 dark brown setae; prosternum, subspiracular area, paratergite, mesomeron and metameron bare; postspiracular area with 2 dark brown setae; mesepisternum with an upper and a small lower patch of broad white scales, 1-2 upper and 5-7 posterior dark brown setae; prealar knob with 5 dark brown setae; mesepimeron with a large patch of broad white scales near center, 4-5 golden-brown setae dorsad of scale patch. *Legs*. Coxae I-III each with several dark brown setae, I with broad pale brown scales and a small dorsal patch of white ones on anterior surface, II and III each with a patch of broad white scales on anterior surface; trochanters I-III each with broad pale scales; femora I and II each with anterior surface dark brown scaled, I and II each with posterior surface brown scaled with a white scaled longitudinal stripe from base to apex, stripe dorsal on I and ventral on II, III brown scaled with an anteroventral and a posteroventral white scaled stripe which is broad basally and narrow apically; tibiae I-III and tarsi I-III each dark brown scaled; posttarsi I-III (Fig. 59) each with 2 ungues, I, II and III each with ungues unequal, each ungue with a tooth. *Wing*. Dorsal and ventral veins with dark brown scales; alula with several narrow to moderately broad brown scales on margin; upper calypter with several brown hairs on margin; 1 remigial seta. *Halter*. Pedicel pale; capitellum dark brown scaled. *Abdomen*. Terga dark brown scaled, I with a patch of broad white scales on laterotergite; sterna brown scaled; terga and sterna with numerous dark setae, mostly along posterior margins. *Genitalia* (Fig. 32). Tergum IX heavily pigmented, formed into a narrow band mesally and expanded laterally into a small caudal lobe which is fused with tergum X, setae absent, connected laterally to sternum IX by a narrow heavily pigmented band; gonocoxite short, broad, heavily pigmented, tergobasal portion of mesal surface membranous with minute spicules, dorsal surface with apex extended into a small strongly sclerotized lobe which bears 2-3 long stout setae, 5-8 moderately long and long stout setae on distal 0.6 of area basad of apical setae, ventral surface produced into a large apicomesal lobe which is heavily pigmented on both tergal and sternal areas, tergal area of lobe with a few short thin setae along outer margin, sternal area of lobe with a number of short thin setae on apical 0.4, a few broad scales on ventral and lateral surfaces of gonocoxite, lateral surface also with a few long stout setae; gonostylus heavily pigmented, moderately long, approximately 0.68 length of gonocoxite, basal 0.5 somewhat swollen, apical 0.5 bifid, outer arm with apical portion somewhat expanded and with 4-5 short setae and 4-5 small stout spiniforms, apex rounded, inner arm with proximal 0.52 swollen and with 5 short thin setae, distal 0.48 narrow, curved and with apex recurved; basal mesal lobe broad, lightly to moderately pigmented, covered with small spicules, 11-12 short thin setae on basomesal area, 5-7 short thin setae on mesal margin, caudal area with 5 short thin setae, caudomesal portion expanded into a small apical hump and a short mesal heavily pigmented pointed projection with a short seta at base (structure resembles a bird's head), sternomesal and caudal margins of basal mesal lobe fused with gonocoxite, lobe connected mesally with its mate by a moderately pigmented broad band which forms a shallow trough ventrad of apical portions of opisthophallus and prosophallus; proctiger with paraproct formed into a long narrow heavily pigmented curved arm, base with a very short rounded projection which extends ventrad and articulates at a point on the dorsal surface of parameral apodeme near base of opisthophallus, base of proctiger strongly fused with tergum X, cercus membranous and without cercal setae; tergum X heavily pigmented, formed into a small plate between proctiger and caudal lateral portion of tergum IX; phallosome complex, opisthophallus--consists of a moderately pigmented tergal transverse bridge between the parameral apodemes, caudal margin produced into a long lobe which extends beyond apex of prosophallus and is broad at the base and tapers to a pointed apex, base attached to a dorsomesal extension of the caudal portion of parameral apodeme, located dorsad of phallus and prosophallus and ventrad of proctiger, phallus--consists of a pair of short heavily pigmented narrowly separated arms which are fused at their bases, sternolateral area of base extended laterally into a moderately long arm which is fused to basomesal portion of prosophallus, apex of phallus formed into a tergal penis filament which consists of a pair of bars extending cephalad, bars connected near base by a broad transverse bridge, apical portion of bars curved dorsad, prosophallus--consists of a pair of long heavily pigmented acuminate arms which have their bases widely separated and their apices contiguous, base of arm attached to mesal portion of paramere, located laterad of phallus, prosophallic arm 2.44 length of phallic arm, paramere--heavily pigmented, broad, long, approximately 1.8 length of phallic arm, articulates near middle with caudal area of parameral apodeme, parameral apodeme--moderately to heavily pigmented, very long, approximately 1.64 length of paramere, outer surface narrowly attached to tergobasal apodeme of gonocoxite; sternum IX heavily pigmented throughout, large, broad, apicolateral margin evenly rounded, 6-7 short and moderately long setae near center of caudal margin (holotype also with one broad scale).

FEMALE, PUPA, LARVA AND EGG. Not known.

DISCUSSION. *Aedes ramalingami* belongs to Section B and the adults can be readily distinguished from the other species of this section except *pahangi, robertsi* and *uniformis* by the dark scaled terga. From the latter 3 species it is separated by having only 4-5 setae dorsad of scale patch on mesepimeron while the other 3 species possess 7 or more setae.

The male genitalia of *ramalingami* differ strikingly from the other species of Section B in the development of the gonostylus and basal mesal lobe.

This species is dedicated to Dr. Shivaji Ramalingam, Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia, in recognition of his work on the Malayian Culicidae and the numerous mosquito specimens he has provided to the SEAMP and MEP collections.

TYPE-DATA. Holotype male, MALAYSIA, *Sabah,* Beaufort, Kg. Maraba, 5 April 1970, Samuel W. James and Chia Yiew Wang collectors, collection number S-382, genitalia preparation number T73.555, SEAMP accession number 300, adult collected resting in bushes of a rubber estate, elevation 76 m and at 1350 hours; one paratype male, same data as holotype except, collection number S-383, genitalia preparation number 55467, and collected at 1410 hours. Holotype and paratype deposited in the USNM.

DISTRIBUTION. Known only from the type-locality.

BIOLOGY. As recorded in the type-data.

AEDES (VERRALLINA) RAMI BARRAUD

(Fig. 59)

The following information is based on the holotype male and supplements the very brief description of Barraud (1928: 370).

FEMALE. *Head.* Antenna 1.07 length of proboscis, pedicel brown with a few small brown scales and short fine hairs mesally; maxillary palpus 0.14 length of proboscis; proboscis 1.1 length of femur I; eyes contiguous in front. *Thorax.* Scutum covered with narrow curved reddish-brown scales; scutellum with narrow curved reddish-brown scales on each lobe; dark setae on the following areas: 4 median anterior promontory, numerous acrostichal (anterior and posterior), numerous dorsocentral (anterior and posterior), scutal fossal (4-5 anterior, 4 lateral and 1 posterior), numerous supra-alar, 1 postalar callar and scutellar (4-5 long and 3-4 short ones on lateral lobe, 6 long and 5 short ones on median lobe); antepronotum with scales absent, 13-14 brown setae; postpronotum with narrow curved reddish-brown scales on upper area, 5 dark posterior setae; propleuron with a patch of broad white scales, 15 setae; prosternum, subspiracular area, mesomeron and metameron bare; postspiracular area with scales absent, 3 brown setae; mesepisternum with a large upper and a small lower patch of broad white scales, 4 upper and 10-11 posterior setae, lower ones shorter; mesepimeron with a large patch of broad white scales near center, 14 setae dorsad of scale patch, several small hairs around lower posterior corner of scale patch. *Legs.* Posttarsi I-III (Fig. 59) each with 2 ungues, I and II each with ungues unequal, larger one with a tooth and smaller one simple, III with ungues equal, both simple. *Wing.* Veins brown scaled; alula with narrow brown scales on margin; 2 remigial setae. *Abdomen.* Missing except for genitalia which are mounted on a microscope slide.

DISCUSSION. *Aedes rami* is apparently a rare species since it is still represented by only the holotype specimen and no additional specimens have been collected. It is easily recognized by the male genitalia as figured by Barraud (1928, Figs. 23, 24).

Tarsomeres 5 and posttarsi are illustrated (Fig. 59) for the first time.

AEDES (VERRALLINA) RARUS DELFINADO
(Figs. 23, 25)

Aedes (*Neomacleaya*) *khmerus* Klein 1973, Contrib. Am. Entomol. Inst. (Ann Arbor) 10(1): 7 (♀*, ♂*). NEW SYNONYM.

The following information, based on the types of *rarus* and *khmerus* and the specimen from Indonesia, supplements the descriptions of Delfinado (1968: 35) and Klein (1973: 7).

FEMALE. *Thorax.* Following setae present: 3-4 median anterior promontory; numerous acrostichal (anterior and posterior); numerous dorsocentral (anterior and posterior); scutal fossal (5-8 anterior, 4-5 lateral and 1-2 posterior); numerous supra-alar; 4-6 posterior medial scutal; 1 postalar callar; scutellar (4-5 long and 3-5 short ones on lateral lobe, 5 long and 3-5 short ones on median lobe); 10-15 antepronotal; 4-6 postpronotal; 11-16 propleural; 5-9 postspiracular; 4-7 upper and 12-16 posterior mesepisternal, lower ones shorter; 9-11 on prealar knob; and mesepimeron with 12-18 dorsad of scale patch, 2-6 short fine hairs caudad of lower margin of scale patch. Prosternum, subspiracular area, paratergite, mesomeron and metameron bare. *Genitalia* (Figs. 23 and 25). As illustrated.

MALE. *Head.* Antenna 0.98-1.17 length of proboscis; maxillary palpus 0.13 length of proboscis; proboscis 1.22-1.25 length of femur I. *Thorax.* Following setae present: 2-3 median anterior promontory; numerous acrostichal (anterior and posterior); numerous dorsocentral (anterior and posterior); scutal fossal (4-5 anterior, 3-5 lateral and 1 posterior); numerous supra-alar; 4-5 posterior medial scutal; 1 postalar callar; scutellar (3-5 long and 1-2 short ones on lateral lobe, 4 long and 2-3 short ones on median lobe); 7-10 antepronotal; 3-6 postpronotal; 9-14 propleural; 2-5 postspiracular; 2-5 upper and 8-14 posterior mesepisternal, lower ones shorter; 6-9 on prealar knob; and mesepimeron with 8-12 dorsad of scale patch, 2-4 short fine hairs caudad of lower margin of scale patch. Prosternum, subspiracular area, paratergite, mesomeron and metameron bare.

DISCUSSION. I have compared the holotype of *rarus* and the allotype of *khmerus* and find them to be conspecific. The adult habitus of the holotype and paratypes of *khmerus* also agree well with those of the holotype of *rarus* and the allotype of *khmerus*. Klein (1973: 7) did not examine the holotype of *rarus* and therefore did not see the male genitalia, which are identical for *rarus* and *khmerus*.

This species is apparently infrequently collected, as denoted by the very few specimens, even though the distribution ranges from Cambodia to Sabah and to Sumatra.

Female genitalia (Fig. 23) of *rarus* are very similar to those of *incertus* but lack the short hair-like spicules on the basal area of the spermathecal eminence. They also resemble those of *panayensis* but have an evenly rounded shield caudad of the spermathecal eminence while this shield is emarginate in *panayensis*.

Male genitalia of *rarus*, *incertus* and *prioekanensis* are similar and are compared in the discussion section of the latter species.

DISTRIBUTION. 11 specimens examined: 8♀, 3♂.

CAMBODIA. *Kompong Speu*, Sre Klong; 1♀ (holotype of *khmerus*), 5♀ (paratypes of *khmerus*), 2♀; Kirirom Hills; 1♂ (allotype of *khmerus*).

MALAYSIA. *Sabah* (North Borneo), Tawau; 1♂ (holotype of *rarus*).

INDONESIA. *Sumatra*, Indragiri; 1♂.

AEDES (VERRALLINA) SABAHENSIS NEW SPECIES
(Figs. 17, 62, 66)

FEMALE (Fig. 66). *Head*. Antenna dark brown, 1.06-1.19 length of proboscis, pedicel dark brown with a few small brown scales and short fine brown hairs mesally, flagellomere 1 with basal 0.4 pale and with a few small brown scales; clypeus dark brown, bare; maxillary palpus dark brown scaled, 0.18-0.19 length of proboscis; proboscis dark brown scaled, 1.00-1.03 length of femur I; eyes contiguous in front; several dark ocular setae; vertex covered with broad blackish-brown decumbent scales except for a few narrow curved whitish scales along coronal suture, a few similar scales on mesal portion of ocular line, lateral surface of head covered with broad blackish-brown decumbent scales except for a dorsal stripe of broad white scales extending from in front of antepronotum to eye margin; occiput with numerous dark brown erect forked scales and several narrow curved and a few broad white decumbent scales. *Thorax*. Scutal integument dark brown; scutum covered with narrow curved reddish-black scales except for narrow curved white scales on median anterior promontory area, anterior scutal fossal area, supra-alar area above paratergite and base of wing, and a few along lateral margins of prescutellar space; scutellum with a patch of narrow curved golden-brown scales on each lobe; dark reddish-black setae on following areas: 3-4 median anterior promontory, numerous acrostichal (anterior and posterior), numerous dorsocentral (anterior and posterior), scutal fossal (3-5 anterior, 4-5 lateral and 2 posterior), numerous supra-alar, 5-6 posterior medial scutal, 1 postalar callar and scutellar (5-6 long and 3-4 short ones on lateral lobe, 5-6 long and 2-4 short ones on median lobe); pleural integument dark brown; antepronota widely separated, scales absent, 12-15 long and short dark setae; postpronotum with narrow curved reddish-black scales on upper area, 5 posterior dark setae; propleuron with a patch of broad white scales, 14-21 dark setae; prosternum, subspiracular area, paratergite, mesomeron and metameron bare; postspiracular area without scales, 3-7 dark setae; mesepisternum with a large upper and a small lower patch of broad white scales (several scales in upper patch with a brown hue), 4-5 upper and 8-10 posterior dark setae, lower ones shorter; prealar knob without scales, 7-9 dark setae; mesepimeron with a patch of broad white scales near center, 12-15 dark setae dorsad of scale patch, 3-5 small golden hairs near lower posterior edge of scale patch. *Legs*. Coxae I-III each with several brown setae, I with broad dark brown scales on anterior surface and a patch of broad white scales dorsally and ventrally of brown ones, II and III each with a small patch of broad white scales on anterior surface; trochanters I-III each with a few short golden setae and a few brown and white scales; femora I and II each with anterior surface dark brown scaled, I with posterior surface brown scaled with a ventral longitudinal white scaled stripe from base to apex, II and III each with posterior surface and also anterior surface of III white scaled with a narrow dorsal longitudinal brown scaled stripe from base to apex, stripe forming a narrow brown scaled band at apex; tibiae I-III and tarsi I-III each dark brown scaled; posttarsi I-III (Fig. 62) each with 2 ungues, I and II with ungues equal, each with a tooth, III with ungues equal, both simple. *Wing*. Dorsal and ventral veins with dark brown scales; alula with several moderately broad and a few narrow brown scales on margin; upper calypter with a number of brown setae on margin; 1-3 remigial setae. *Halter*. Pedicel pale; capitellum brown scaled. *Abdomen*. Terga each blackish-brown scaled with a laterobasal white scaled patch; sterna II-VII each brown scaled with a narrow basal band of creamy-white scales which becomes broader laterally; terga and sterna with numerous golden setae, mostly along posterior margins. *Genitalia* (Fig. 17). Tergum VIII moderately pigmented, wide, base slightly concave, apex broadly convex, several long stout setae along apical margin and several moderately long ones on apical 0.33-0.36, basolateral seta present, covered with minute spicules, numerous broad scales covering apical 0.82-0.84, VIII-Te index 0.43-0.44, VIII-Te/IX-Te index 5.53-6.82; sternum VIII moderately pigmented, wide, base concave mesally, apex with a shallow median indentation with a small lobe on each side of midline, numerous moderately long setae apically, numerous short and a few long setae scattered over apical 0.87-0.92, covered with minute spicules, numerous broad scales covering most of apical 0.82-0.85, apical intersegmental fold unpigmented, VIII-S index 0.58-0.64; tergum IX moderately pigmented, very wide and short, ribbon-like, setae absent, covered with minute spicules, IX-Te index 0.12-0.16; insula unpigmented, short, covered with minute spicules, 4 small tuberculi, each with a tiny spicule; lower vaginal lip heavily pigmented, narrow, a few minute spicules on outer part of hinge area, with a small caudally projecting heavily pigmented median apodeme, lower vaginal sclerite composed of a pair of long slender heavily pigmented plates which are connected basally, with minute spicules (more numerous and longer on apical area), apical portion slightly expanded and slightly cupped; upper vaginal lip heavily pigmented, posterolateral corners slightly produced, median posterior area produced into a shield caudad of spermathecal eminence, upper vaginal sclerite heavily pigmented, large and complex, base attached along entire lateral inner margin of upper vaginal lip and covering most of vaginal roof; spermathecal eminence heavily pigmented, large, deep in depth, triangular in dorsal outline, short fine branched spiny excrescences attached to most of dorsal area; postgenital lobe short, apex with a moderately deep median indentation, 14-24 setae on each side of midline, completely covered with minute spicules, dorsal PGL index 0.64-0.69, ventral PGL index 0.81-0.93; peri-anal membrane with minute spicules; cercus triangular in shape, moderately long, broad at base, apex acute, completely covered with minute spicules, dorsal surface with a number of moderately long setae over most of apical 0.75-0.78, ventral surface with a number of short and moderately long setae along outer area, a few long setae at apex, scales absent, cercus index 2.44-2.63, cercus/dorsal PGL index 3.18-3.33; 3 seminal capsules, 1 large, 1 medium and 1 small in size, heavily pigmented, elliptical, each with a neck and with several small seminal capsule pores near orifice, base of accessory gland duct unpigmented.

MALE, PUPA, LARVA AND EGG. Not known.

DISCUSSION. *Aedes sabahensis* is similar in adult habitus to *cautus* and *pseudomediofasciatus*; however, it can be separated from these 2 species by the abdominal markings and the number of setae on the propleuron. Features of the female genitalia readily distinguish each of the 3 species. The female genitalia of *sabahensis* are also easily separated from all other species of the subgenus in the development of the lower vaginal sclerites which are represented by a pair of long narrow spiculate plates, joined basally and slightly expanded apically.

Delfinado (1967: 13) mistakenly described and illustrated the female of *sabahensis* as *cautus*. The adults of these 2 species, as mentioned above, are similar in adult habitus but possess markedly different genitalia.

TYPE-DATA. Holotype female, MALAYSIA, *Sabah*, Beaufort, Kg. Bingkul, 1 April 1970, Sulaiman bin Omar and Chia Yiew Wang collectors, collection number S-318, genitalia preparation number T73.487, SEAMP accession number 300, adult collected biting man at 1900-2000 hours in a village with numerous nipa palms and at an elevation of 30 m; one paratype female, same data as holotype except genitalia preparation number 54374; one paratype female, MALAYSIA, *Sabah*, Kengingau, 16 August 1956, collection number US-79, genitalia preparation number T73.389, SEAMP accession number 24, collected from a horse-baited trap; one paratype female, MALAYSIA, *Sabah*, Papar, 26 July 1965, F. Y. Cheng collector, collection number 101, genitalia preparation number 10-III-66 (identified as *cautus* by Delfinado); and one paratype female, MALAYSIA, *Sabah*, Forest camp 9.8 km southwest of Tenom, 18 December 1962, Y. Hirashima collector, genitalia preparation number T73.430. The holotype and 3 paratypes are deposited in the USNM, and one paratype (T73.389) will be deposited in the BMNH.

DISTRIBUTION. Known only from localities mentioned in the type-data.

BIOLOGY. Females were taken biting man (bare leg catch) in a village with numerous nipa palms, at 30 m elevation, and at 1900-2000 hours. One female was collected in a horse-baited trap.

AEDES (VERRALLINA) SECULATUS MENON

DISCUSSION. I have examined the male and female cotypes of *Aedes carteri* and agree with Stone's (1956: 339) synonymy of this species with *seculatus*; however, only the males are conspecific. The female cotype and an additional female of *carteri* are synonymous with *butleri*. The adult female cotype of *carteri* is very badly damaged (only part of the head and part of the thorax remain on the pin and no genitalia mount could be found) and could not be identified; however, a female genitalia, No. 187 (assumed by me to be the female from Denipitiya mentioned by Wijesundara (1951: 176)), mounted in Canada balsam on a slide, and labeled as a paratype of *carteri* can be determined as *butleri*. Figure 5 of Wijesundara (1951) appears to have been drawn from the genitalia slide No. 187. Since the adult fragment of the female cotype does not possess any remaining characters that can be used to identify it to species I assume it to be conspecific with the Denipitiya female, the genitalia of which are identical to those of the lectotype of *butleri*. The adult male cotype of *carteri* is also heavily damaged (only a thoracic fragment remains on the pin) but the male genitalia, mounted in Canada balsam on a slide, clearly indicate this species is identical to the type male of *seculatus*, which I have also examined. The male cotype of *carteri* in the BMNH is hereby selected lectotype and bears the following data on the adult and genitalia slide mount labels: type ♂, Hypo. No. 102, Matugama R. H. [Rest House], 2.9.21, Rainwater puddle in dense shade, pupa & larva skins, Med. Entomologist, Ceylon. The female cotype of *carteri* possesses the same data on the labels as the cotype male except the following: 29.8.21. and Hypo. No. 151 and the remaining female genitalia, mounted on a slide, contain the following information--paratype, 187, *Aëdes* (*Aëdes*) *carteri* Wijesundara, are transferred to synonymy with *butleri*.

AEDES (VERRALLINA) SOHNI NEW SPECIES
(Figs. 33, 56)

MALE. *Head*. Antenna plumose, brown with pale areas, 0.85-0.99 length of proboscis, pedicel dark brown, flagellomere 1 with a few small brown scales near middle; clypeus dark brown, bare; maxillary palpus dark brown scaled, 4 segmented, 0.12 length of proboscis; proboscis dark brown scaled, 1.13 length of femur I; eyes contiguous; ocular setae blackish-brown and well developed; scales on head all broad, blackish-brown and decumbent except for a few narrow curved white scales along coronal suture and upper interocular space, a stripe of broad white scales extending from area in front of antepronotum to ocular line, and a patch of dark brown erect forked scales on occiput. *Thorax*. Scutal integument dark reddish-brown; scutum covered with narrow curved reddish-brown scales except for narrow curved white scales on the following: small patch on median anterior promontory area, small patch on anterior scutal fossal area and extending caudally onto lateral scutal fossal area, a few along scutal ridge and on acrostichal area, patch on supra-alar area and a few on posterior medial scutal area; scutellum with a patch of narrow curved pale brown scales on each lobe; prescutellar space bare; reddish-black setae on the following areas: 6-10 median anterior promontory, numerous acrostichal (anterior and posterior), numerous dorsocentral (anterior and posterior), scutal fossal (7-9 anterior, 4-5 lateral and 1-2 posterior), numerous supra-alar, 6 posterior medial scutal, 1 postalar callar and scutellar (4-5 long and 4-8 short ones on lateral lobe, 4 long and 6-8 short ones on median lobe); pleural integument brown; antepronota widely separated, a few broad white scales, 9-13 long and short dark setae; postpronotum with a few narrow curved reddish-brown scales on upper area, 4-6 dark posterior setae, a few short dark hairs cephalad of setae; propleuron with a patch of broad white scales, 16-18 setae; prosternum with a patch of short brown setae on the upper mesal area; subspiracular area, paratergite and mesomeron bare; postspiracular area with a small patch of broad white scales caudad of setae, 2-4 brown setae; mesepisternum with a large upper and a small lower patch of broad white scales, 3-5 upper and 12-14 posterior brown setae, a few short fine pale golden hairs dorsad and ventrad of lower scale patch; prealar knob without scales, 9 brown setae; mesepimeron with a patch of broad white scales near center, 10-11 setae dorsad of scale patch, several short fine golden hairs caudad of scale patch; metameron with several small broad white scales and several short fine pale hairs. *Legs.* Coxae I-III each with several brown setae, I with broad brown scales and a small dorsal and a ventral patch of broad white scales on anterior surface, II with a patch of broad white scales on anterior surface, III with a ventral and a dorsal patch of broad white scales on anterior surface; trochanters I-III each with broad pale scales; femora I and II each with anterior surface brown scaled, posterior surface with a longitudinal white scaled stripe from base to near apex, stripe dorsal on I and ventral on II, III brown scaled with a ventral longitudinal white stripe from base to near apex on both anterior and posterior surfaces; tibiae I-III and tarsi I-III each dark brown scaled; posttarsi I-III (Fig. 56) each with 2 ungues, I and II each with ungues unequal, each with a tooth, III with ungues equal, both simple. *Wing.* Dorsal and ventral veins with blackish-brown scales; alula with several narrow brown scales on margin; upper calypter with several brown setae on margin; 1 remigial seta. *Halter.* Pedicel pale; capitellum dark brown scaled. *Abdomen.* Terga dark brown scaled, I-VI each with a small laterobasal patch of white scales (remainder of abdomen removed with genitalia); sterna white scaled with a few pale brown scales along posterior margins of several sterna; terga and sterna with several brown setae, most numerous along posterior margins. *Genitalia* (Fig. 33). Tergum IX heavily pigmented, band-like with lateral areas broader than median area, outer caudal margin fused to tergum X, setae absent, broadly connected laterally to sternum IX; gonocoxite short, broad, heavily pigmented, mesal surface membranous with minute spicules, dorsal surface with apex projected into a long moderately broad tapering flattened lobe with apical area bifid, 4-5 long stout setae along outer proximal area, a few short and long setae on apical area of dorsal surface of gonocoxite, ventral surface projected into a broad flattened mesal area with a rough apical lobe, numerous short stout setae on flattened area, several long stout setae on apical 0.65 of remainder of gonocoxite, ventral surface also with an outer apical short rounded arm which bears 2-3 long heavily pigmented flattened pointed spines, lateral surface with a few long setae, broad scales on outer area of dorsal surface and on lateral and ventral surfaces; gonostylus long (approximately 1.12 length of gonocoxite minus apical lobe), narrow, curved, base with a small lobe bearing 2 moderately long setae, apex slightly recurved, attached subapically on gonocoxite; basal mesal lobe moderately pigmented, consists of a basal flattened area bearing 2-3 moderately long heavily pigmented spiniforms, 2-3 short lightly pigmented spiniforms and numerous short thin setae, a narrow distal extention on gonocoxite along mesal margin to apex which bears several moderately long thin setae and terminates in a long slender rounded arm with a short stout subapical spine (holotype with spine asymmetrical, one side as above and other side with a long stout setae attached near base of arm instead of a spine), lobe connected mesally with its mate by a narrow moderately pigmented band covered with minute spicules and located ventrad of apical portion of prosophallus and phallus; proctiger with paraproct formed into a heavily pigmented long slender curved bluntly pointed arm with basal area slightly expanded and connected to tergum IX, base with a short projection which extends ventrad and articulates at a point on the dorsomesal surface of the parameral apodeme near base of opisthophallus, cercus membranous and without cercal setae; tergum X moderately to heavily pigmented, indistinct from tergum IX; phallosome complex, opisthophallus--consists of a moderately pigmented tergal transverse bridge between parameral apodemes, caudal margin nearly straight, sternobasal area attached to tergobasal portion of prosophallus, located dorsad of phallus and prosophallus and ventrad of proctiger, phallus--consists of a pair of moderately long, heavily pigmented, narrowly separated, caudally produced arms which are fused together by a narrow basal plate which extends laterally and is fused to basal portion of prosophallus, apex of phallus formed into a tergal penis filament which consists of a small lightly pigmented lobe produced cephalad, prosophallus--consists of a pair of moderately long heavily pigmented widely separated arms, apex blunt, basal portion somewhat expanded and attached to mesal portion of paramere, located laterad and slightly ventrad of phallus, prosophallic arm approximately equal in length to phallic arm, paramere--heavily pigmented, approximately equal in length to phallic arm, articulates at a point approximately 0.65 from base with caudal area of parameral apodeme, parameral apodeme--moderately to heavily pigmented, moderately long, outer surface broadly attached to tergobasal apodeme of gonocoxite; sternum IX heavily pigmented throughout, large, broad, lateroapical areas rounded, 25-31 short and moderately long setae in an elongate patch along caudal margin, 1 broad scale on holotype.

FEMALE, PUPA, LARVA AND EGG. Not known.

DISCUSSION. *Aedes sohni* belongs to the *andamanensis* Group of species. The adult habitus is very similar to the other members of the group and can not be separated from them with certainty (except *johnsoni* which lacks setae on the prosternum). The male genitalia, however, are easily distinguished from the other species by the development of the basal mesal lobe, gonocoxite with sternoapical portion expanded, thickening of the paraproct and the development of the gonostylus. See discussion section of *adustus* for additional information.

This species is dedicated to Young T. Sohn, scientific illustrator for the Medical Entomology Project, for preparing the many fine detailed illustrations included in this and other articles.

TYPE-DATA. Holotype male (genitalia mounted on a slide in Canada balsam) with the following collection data: MALAYSIA, *Sabah*, Sapulut, Pensiangan, 11 April 1970, collection number S-481, Sulaiman ben Omar and Chia Yiew Wang collectors, SEAMP accession number 300, genitalia preparation number 74/459, collected as an adult on a clear day, in a secondary rain forest, in a partially shaded area by the side of a river, at 1225 hours, and at an elevation of 168 m; and one paratype male with the following collection data: THAILAND, *Narathiwat*, Amphoe Waeng, in the jungle 1 km from Soi Teo 5 in Naeng Settlement, 22 February 1965, collection number NV76-12, Sumeth Chunchuncherm collector, genitalia preparation number 74/487, collected as a pupa from a small puddle (2 feet by 2 feet) containing slightly turbid water in a moderately shaded area. Holotype and paratype deposited in the USNM and are in excellent condition except 3 left legs missing from the holotype and the pupal skin of the paratype is missing.

DISTRIBUTION. Known only from localities mentioned in the type-data.

BIOLOGY. As recorded in the type-data.

AEDES (VERRALLINA) TOROSUS DELFINADO
(Figs. 45, 48, 57)

PUPA (Fig. 45). Chaetotaxy as figured and recorded in Table 12. Description based on 2 pupal skins with associated male adults. Ocular plate with a small area of moderately developed cuticular facets. *Respiratory trumpet.* Moderately to heavily pigmented, hair-like spicules on distal 0.76-0.87 of inner surface; index 3.31-3.39. *Abdomen.* Setae 6, 9-VII weakly developed;

4-VIII with 4-5 branches; 9-VIII single. *Paddle*. Ovoid; minute serrations on distal portion of basal 0.63-0.71 of outer margin, more strongly developed on distal area; minute spicules on apical 0.30-0.38 of outer and apical 0.10-0.13 of inner margins; midrib does not reach apex; seta 1-P moderately long, single; index 1.56.

LARVA (Fig. 48). Chaetotaxy as figured and recorded in Table 24. Description based on 2 larval skins with associated adults. *Head*. Seta 4-C with 5-6 branches; 5-C double or triple; 6-C single; 7-C with 7-8 branches; 12-C with 5-6 branches; dorsomentum with 37-38 teeth. *Antenna*. Moderately long, moderately pigmented, with a number of scattered small spicules; seta 1-A triple to 4 branched, moderately long; 2-A long, with a subapical constriction; 3-A short, 0.17-0.23 length of 2-A; 4-A moderately long, 0.44-0.57 length of 2-A; 6-A short, 0.28-0.32 length of 2-A. *Thorax*. Seta 6-T triple to 5 branched. *Abdomen*. Seta 1-VII 4 branched; 3, 5-VIII with 7-9 branches; 2-X with 6-9 branches; ventral brush with 8-10 setae on grid and 2 precratal shorter ones, all multiple branched; saddle moderately pigmented, incompletely rings segment X, acus absent; 4 moderately long anal papillae; comb with 11-13 (usually 12) scales arranged in a single curved irregular row, each scale with a stout median apical spine and small denticles on laterobasal areas. *Siphon*. Moderately pigmented; acus well developed; index 2.13-2.31, average 2.22; pecten on basal 0.59-0.60 of siphon, composed of 14-15 (usually 14) teeth, apical 2 teeth longer and wider spaced than remainder of teeth, each tooth long, slender and with 1-2 small stout ventral denticles near base; seta 1-S short, 4-6 branched, base attached on basal 0.69-0.71 of siphon distad of last pecten tooth.

DISCUSSION. The present descriptions and illustrations are the first for the pupa and fourth stage larva and are based on the specimens from Prachin Buri Province, Thailand.

Tarsomeres 5 and posttarsi of the male are illustrated (Fig. 57) for the first time.

DISTRIBUTION. 8 specimens examined: 4♂, 2 with associated pupal and larval skins.

THAILAND. *Khon Kaen*, Tham Pho Ti Yan; 2♂ (holotype and paratype, USNM type No. 69216). *Prachin Buri*, Ban Tub Lan; 2♂ pl.

BIOLOGY. The above larvae were collected from a small seepage pool containing clear, fresh, unmoving, temporary water, in partial shade, located in a secondary scrub area in a valley and at an elevation of 80 m.

AEDES (VERRALLINA) UNCUS (THEOBALD)

(Figs. 23, 55, 57, 62)

Aedes (*Aedes*) *hirsutipleura* Barraud 1928, Indian J. Med. Res. 16: 370 (♂*, ♀*). NEW SYNONYM.

LARVA (Fig. 55). Chaetotaxy as figured and recorded in Table 25. *Head*. Seta 4-C with 5-7 branches; 5-C double or triple; 6-C single; 7-C with 5-10 branches; 12-C with 7-10 branches; dorsomentum with 38-42 teeth. *Antenna*. Moderately long, lightly pigmented, with several small scattered spicules; seta 1-A triple to 6 branched, moderately long; 2-A long, with a subapical constriction; 3-A short, 0.20-0.27 length of 2-A; 4-A moderately long, 0.37-0.53 length of 2-A; 6-A short, 0.26-0.30 length of 2-A. *Abdomen*. Seta 1-VIII triple to 6 branched; 3-VIII with 6-11 branches; 5-VIII with 6-10 branches; 2-X with 5-8 branches; ventral brush with 12 setae on grid and 2 precratal shorter ones, all multiple branched; saddle moderately pigmented, incompletely rings segment X, acus absent; 4 moderately long anal papillae; comb with 10-12 (usually 12) scales arranged in a single curved row, each scale with a stout median apical spine and small denticles on laterobasal areas. *Siphon*. Moderately pigmented; acus well developed; index 1.77-2.15, average 1.95; pecten on basal 0.54-0.61 of siphon, composed of 13-16 (usually 15) teeth, apical 2 teeth longer and wider spaced than remainder of teeth, each tooth long, slender and with 1-2 small stout ventral denticles near base; seta 1-S short, 4-8 branched, base attached on basal 0.63-0.68 of siphon distad of last pecten tooth.

DISCUSSION. A single male (with genitalia preparation T73.255) in the USNM from Mindanao reestablishes the range of *uncus* on this island. Material forming the previous record from Mount Apo, Mindanao (Bohart 1945: 66) served as the type material of *nubicolus*, a new species described by Laffoon (1946: 237).

Delfinado's record (1967: 32) of *uncus* larvae collected from axils of the elephant ear plant (*Colocasia*) is a doubtful biological record. There are 2 male and 2 female specimens of *uncus* in the USNM from Palawan, P.I., and each bears 2 labels. The upper label contains the following data--P 335, *Aëdes uncus* Theobald; data on the lower label are as follows--P355, 19MGL, Elephant ear axil, Palawan, 2-X-45. Since the collection numbers (P335, P355) on the 2 labels are different, it appears that there was a mix-up in attaching labels to the specimens and the lower labels do not belong to the specimens of *uncus*. In addition, this would be an unusual habitat for the immatures of *uncus*, as well as other members of the subgenus. Other collections of *uncus* by the 19th Medical General Laboratory (19MGL) in the same area and near the date were adult resting and biting collections and these specimens are in a badly rubbed condition similar to those of the P335 collection. If the P335 specimens were reared from immatures they probably would have been in better condition. Immature skins of *uncus* from the P335 or other collections made by the 19MGL from Palawan are not in the USNM.

Borel's (1930: 291) description and figure of *Aedes* sp. ? no. 51 compare very well with those of *Aedes uncus* and I am confident they belong to this species.

The present description and illustration are the first of the fourth stage larva of this species and are based on several whole larvae and reared specimens with associated pupal skins and adults from Malaysia and several whole larvae from the Philippines.

Barraud (1928: 370) originally described *Aedes* (*Aedes*) *hirsutipleura* from one female and one male cotypes and 5 other females and 3 other males. The 2 cotypes and one female and one male (labeled as paratypes) are deposited in the BMNH. The male cotype is hereby designated lectotype and bears the following label data: Type ♂, Golaghat, Assam, Jan. 1925, P. J. Barraud, No. 2085, B. M. 1935-622., ♂ genit. YMH-66-BM-3 [YMH = Yiau-Min Huang], SEAMP Accession Number 374; allolectotype is designated for the female cotype and bears the following data on the adult labels: same as lectotype except No. 2086 and ♀ genit. YMH-66-BM-6. Condition of the lectotype follows: thorax split on right side, right wing missing, 3 legs on right side broken off, 2 of these glued to cork stage, and genitalia mounted in Canada balsam on a microscope slide.

Aedes uncus belongs to a group of closely related species (*cyrtolabis*, *harrisonicus*, *latipennis*, *leicesteri*, *macrodixoa*, *neomacrodixoa*, *nubicolus*, *protuberans*, *singularis*, *torosus* and *virilis*) all of which are extremely similar in adult habitus and can not be separated from each other with certainty by habitus features. The species of this group, however, are easily distinguishable by characters of both the male and the female genitalia. Members of this species group share the following combination of characters: mesepisternum with several fine hairs on anterodorsal area; mesepimeron with numerous fine hairs caudad of scale patch and extending to near lower margin of sclerite; male genitalia with both prosophallus and phallus very long, approximately equal in length, the later very slender; and female genitalia with lower vaginal sclerite large, usually with an apical median notch, spermathecal eminence with a characteristic shape and the inner margin heart-shaped.

Tarsomeres 5 and posttarsi of the male (Fig. 57) and the female (Fig. 62) and tergum IX of the female genitalia (Fig. 23) are illustrated for the first time.

DISTRIBUTION. 321 specimens examined: 146♀, 69♂, 4 p, 30 L, 47 with associated skins (22 p, 25 l).

CAMBODIA. *Kompong Sela,* Stung Chral; 9♀. *Kompong Speu,* Kirirom; 1♀.

INDONESIA. *Java,* Bali Bengkula; 1♀. *Sumatra,* Atchin, Kotta Tjane; Dermajoe (Benkoelen); 3♀, 9♂.

MALAYSIA. *Negri Sembilan,* Bahau; 19♀ pl, 31♀, 4♂ pl, 26♂, 24 L. *Perlis,* Kaki Bukit, Kubang Tiga; 1♀ pl, 1♂ pl. *Sabah,* Beaufort, Kg. Bingkul, Kg. Maraba, Kuala Papar, Tenom, Tuaran; 21♀, 7♂. *Selangor,* Kuala Lumpur, Templer Park; 2♀, 1 L.

PHILIPPINES. *Balabac Island,* Cape Melville; 2♀, 1♂. *Culion Island;* 1♂. *Mindanao Island,* along Davao highway near Cotabato; 1♂. *Palawan Island,* Irahuan River Valley, Puerto Princesa; 16♀, 10♂, 5 L.

SOUTH VIETNAM. *Khanh Hoa,* My Ca; 1♀.

THAILAND. *Chiang Mai,* Chiang Mai; 1♀, 1♂. *Chon Buri,* Khao Mai Keo; 2♀. *Khon Kaen,* Tham Pho Ti Yan; 1♂. *Nakhon Nayok,* Amphoe Muang, Khao Yai National Park, Sariga; 2♀. *Nakhon Ratchasima,* Khlong Phai, Amphoe Pak Chong, Lam Nam Tha; 5♀. *Songkhla,* Amphoe Haad Yai, near Ton Nga Chang Waterfalls; 16♀ p, 2♀, 6♂ p, 4 p. *Nakhon Si Thammarat,* Banna Nabon; 1♀. *Trang,* Amphoe Muang, Ban Kon Tn Thaningarm; 1♂.

BIOLOGY. In Thailand immatures were collected from large stream pools in a dry stream bed (filled with rain water) and a seepage pool; from colored or turbid, fresh, unmoving, temporary water in moderately to heavily shaded areas located in secondary rain forests and bamboo groves; and at an elevation of 500 m. Adults were collected biting man in a forest during a rain shower and resting in heavy forest vegetation.

Immatures in Malaysia were collected from small flood and ground pools and a small swampy area; from clear, colored or turbid, fresh, unmoving, temporary water in moderately to heavily shaded areas; located in rubber plantations and secondary rain forests; and at elevations from sea level to 76 m. Adults were taken biting man between 1900-2000 hours in a nipa palm village, in a secondary rain forest at 1010 hours and in heavy shade in scrub area of a rubber plantation between 1300-1440 hours.

Adults in the Philippines were collected biting man at 0900 hours in a coconut-bamboo grove and biting man during the morning in a jungle.

One female was collected in a light trap in South Vietnam. The light trap was situated in a beach environment near My Ca.

AEDES (VERRALLINA) VALLISTRIS BARRAUD
(Figs. 23, 46, 52, 57, 62)

PUPA (Fig. 46). The following description and Table 13 are the first description of the pupa of this species. *Respiratory trumpet.* Moderately pigmented; index 3.41-4.46, average 4.05. *Abdomen.* Setae 6, 9-VII weakly developed; 4-VIII double; 9-VIII double or triple. *Paddle.* Ovoid; minute serrations on distal portion of basal 0.6 of outer margin; minute spicules on apical 0.4 of outer and apical 0.21 of inner margins; midrib does not reach apex; seta 1-P moderately long, single; index 1.31-1.44, average 1.38.

LARVA (Fig. 52). The following description and Table 26 are the first description of the larva of *vallistris* and are taken from 2 damaged skins with associated adults. *Head.* Seta 4-C with 9 branches; 5, 6-C triple; 7-C with 8-13 branches; 12-C with 7 branches; dorsomentum with 36-39 teeth. *Antenna.* Moderately long, lightly pigmented, with several scattered small spicules, most numerous on basal area; seta 1-A triple to 4 branched, moderately long; 2-A long, with a subapical constriction; 3-A short, 0.24-0.25 length of 2-A; 4-A moderately long, 0.56 length of 2-A; 6-A short, 0.24-0.25 length of 2-A. *Abdomen.* Setae 1, 3-VIII with 6-8 branches; 5-VIII with 8-13 branches; 2-X with 7-9 branches; ventral brush with 10 setae on grid and 2 precratal shorter ones, all multiple branched; saddle moderately pigmented, incompletely rings segment X, acus absent; 4 moderately long anal papillae; comb with 10 scales arranged in a single irregular row, each scale with a stout median apical spine and small denticles on laterobasal areas. *Siphon.* Moderately pigmented; acus well developed; index 1.89-2.07; pecten on basal 0.61-0.62 of siphon, composed of 9-11 (usually 11) teeth, apical 2-3 teeth longer and wider spaced than remainder of teeth, each tooth long, slender and with 1-2 small stout ventral denticles near base; seta 1-S short, double or triple, base attached on basal 0.72-0.73 of siphon distad of last pecten tooth.

DISCUSSION. Many of the specimens reported as *vallistris* from Thailand by Delfinado (1967: 33) were incorrectly identified. These records of this species from Thailand are in error and were based on the following specimens (correct identifications are in parentheses): Chiang Mai (M694-21♀), *atrius*); Nakhon Nayok (NY-60♀, *uncus*; NY-141♀, *cretatus*; no male found); Nakhon Ratchasima (T-9338♀, *uncus*); Nakhon Si Thammarat (T-1576♀, *uncus*; T-1602♀, *notabilis*); Ubol (T-880♀, unidentifiable fragment on pin, no genitalia preparation); and Udorn (T-5292♀, *butleri*). After examining the above list it is found the only valid record of *vallistris* cited by Delfinado (1967: 33) remaining for Thailand is from Chiang Mai Province. *Aedes vallistris* is similar in the adult habitus to several species in the subgenus and positive identification should be made from genitalia preparations. All of the specimens in the above list did not have the genitalia prepared prior to the present study which could partially explain the previous misidentifications. From the illustration and discussion of *vallistris* by Iyengar and Menon (1956: 791) this species is also reported from Yala and Pattani in southern Thailand.

Tergum IX of the female genitalia is illustrated (Fig. 23) for the first time. This structure occasionally has a single short seta on lateroapical margin of one side. The posttarsi of the male (Fig. 57) and the female (Fig. 62) are illustrated for the first time.

DISTRIBUTION. 37 specimens examined: 29♀, 4♂, 2 with associated pupal and larval skins.

CAMBODIA. *Kandal*, Phnom Penh, Arey Ksatr, Chrui Chang War; 8♀.

THAILAND. *Chiang Mai*, Ban San Khayom, Huey Chang Kien; 2♀ pl, 19♀, 4♂.

BIOLOGY. Immatures in Thailand were collected from a large well containing clear, fresh, unmoving, temporary water in a partially shaded area located in a village and at an elevation of 300 m. Adults in Thailand were taken biting man in bamboo forests and resting in a bamboo forest located at the margin of a rice field.

AEDES (VERRALLINA) VARIETAS (LEICESTER)

(Figs. 23, 62)

DISCUSSION. Delfinado (1968: 40) reported the male genitalia of the lectotype of *varietas* as missing from the celluloid mount on the adult pin. After careful examination of the celluloid mount, which was strongly curved upward and very dark, I was able to locate the genitalia. The genitalia were in poor condition, but recognizable, and were remounted in Canada balsam on a microscope slide bearing the designation T73.295. Delfinado also stated the lectotype label read "Jungle Pahang Rd 5th mile." It actually reads--Jungle Pahang Rd 4th mile. For a discussion on the lectotype designation see Knight and Hull (1953: 474) and Delfinado (1968: 40).

The female posttarsi (Fig. 62) and tergum IX (Fig. 23) of the female genitalia are illustrated for the first time.

The females listed below compare well with the lectotype of *varietas* and the description and illustration of Delfinado (1968) and are therefore provisionally assigned to this species.

DISTRIBUTION. 26 specimens examined: 23♀, 3♂.

INDONESIA. *Sumatra,* Atchin District, Kotta Tjane, Benkoelen District, Dramajoe; 8♀, 2♂.

MALAYSIA. *Selangor,* Kuala Lumpur, Segambut; 12♀, 1♂ (lectotype). *Trengganu,* Kuala Brang, Kg. Payang; 1♀, Kg. Tapah; 1♀.

SINGAPORE. West coast road 8.5 miles; 1♀.

BIOLOGY. Adult females from Malaysia were taken biting man and the female from Singapore was collected at 1900 hours in a resting collection near sea level.

AEDES (VERRALLINA) VIRILIS (LEICESTER)

(Figs. 18, 34, 57, 61)

FEMALE. *Head.* Antenna dark brown, 0.91-0.95 length of proboscis, pedicel dark brown basally and yellow apically, with a few small brown scales and short fine brown hairs mesally, flagellomere 1 with basal 0.35 pale and with a few small brown scales; clypeus dark brown, bare; maxillary palpus dark brown scaled, 0.15 length of proboscis; proboscis dark brown scaled, 1.19-1.21 length of femur I; eyes contiguous in front; several dark ocular setae; vertex covered with broad blackish-brown decumbent scales except for narrow curved golden-white scales along posterior 0.5 of coronal suture, a few similar scales on ocular line, lateral surface of head covered with broad blackish-brown decumbent scales except for a dorsal stripe of broad white scales extending from in front of antepronotum to eye margin; occiput with numerous brown erect forked scales and narrow curved golden-white decumbent scales, a few scattered broad decumbent white scales. *Thorax.* Scutal integument brown; scutum covered with narrow curved reddish-black scales except for narrow curved golden-white scales forming a small patch on median anterior promontory and anterior scutal fossal areas, a few similar scales on lateral scutal fossal area; scutellum with a patch of narrow curved reddish-black scales on each lobe; prescutellar space bare except for a median cephalic extention of narrow curved reddish-black scales; dark reddish-black setae on following areas: 4-5 median anterior promontory, numerous acrostichal (anterior and posterior), numerous dorsocentral (anterior and posterior), scutal fossal (4-7 anterior, 5-7 lateral and 1-2 posterior), numerous supra-alar, 6 posterior medial scutal, 1 postalar callar and scutellar (5-6 long and 4-6 short ones on lateral lobe, 6 long and 5-6 short ones on median lobe); pleural integument brown; antepronota widely separated, scales absent, 16-21 long and short dark setae; postpronotum with narrow curved reddish-black scales on upper area, 6-7 posterior dark setae, a few short fine dark hairs cephalad of setae; propleuron with a patch of broad white scales, 17-20 setae; prosternum, subspiracular area, paratergite, mesomeron and metameron bare; postspiracular area with 9-11 dark setae, scales absent; mesepisternum with a large upper patch of broad brown scales and a small lower patch of broad white scales, several short fine golden hairs cephalad of and caudad of upper scale patch, 7-8 upper and 15-16 posterior brown setae; prealar knob with 17-19 dark setae, scales absent; mesepimeron with a patch of broad white scales near center, 26-29 light brown setae dorsad of scale patch, numerous small golden hairs caudad of scale patch and extending from top of patch to near lower margin of sclerite. *Legs*. Coxae I-III each with several brown setae, I with broad dark brown scales on anterior surface and a small patch of broad white scales dorsally, II and III each with a patch of broad white scales on anterior surface; trochanters I-III each with several white scales; femur I with anterior surface brown scaled and posterior surface white scaled with a longitudinal narrow brown stripe from base to apex, II with anterior and posterior surfaces brown scaled and with a longitudinal white scaled stripe from base to near apex, stripe narrow anteriorly and broad posteriorly, III with anterior and posterior surfaces white scaled and with a dorsal longitudinal narrow brown stripe from base to apex of anterior and posterior surfaces, stripe forming a narrow brown band at apex; tibiae I-III each brown scaled, I and II each with a posterior longitudinal white scaled stripe from base to apex, stripe posteroventral on I; tarsi I-III brown scaled; posttarsi I-III (Fig. 61) each with 2 ungues, I and II with ungues equal, each with a tooth, III with ungues equal, both simple. *Wing*. Dorsal and ventral veins with dark brown scales; alula with several moderately broad brown scales on margin; upper calypter with a number of brown setae on margin; 1 remigial seta. *Halter*. Pedicel pale; capitellum brown scaled with white scales at apex. *Abdomen*. Terga dark brown scaled, each with a laterobasal white scaled patch; sterna white scaled with brown scaled apical bands; terga and sterna with numerous golden-brown setae, mostly along posterior margins. *Genitalia* (Fig. 18). Tergum VIII moderately pigmented, wide, base slightly concave, apex gently convex, a number of short and moderately long setae on apical 0.35, several long setae along apical margin, numerous broad scales covering apical 0.70-0.74, basolateral seta absent; sternum VIII moderately pigmented, wide, base slightly concave, apex with a small median indentation with a small lobe on each side of midline, a number of moderately long setae apically, numerous short and moderately long setae scattered over apical 0.90-0.92, numerous broad scales covering most of area, apical intersegmental fold unpigmented, VIII-S index 0.56-0.59; tergum IX moderately pigmented, wide and short, ribbon-like, setae absent, covered with minute spicules, IX-Te index 0.21-0.28; insula unpigmented, short, covered with minute spicules, 5-6 small tuberculi, each with a minute spicule; lower vaginal lip heavily pigmented, narrow, a few minute spicules on outer part of hinge area, with a small caudad projecting heavily pigmented median apodeme, lower vaginal sclerite composed of a large median heavily pigmented apically wrinkled plate with small spicules and a narrow median indentation on apical 0.35; upper vaginal lip heavily pigmented, produced laterally, lateroposterior corners forming small lobes, median posterior area produced into a shield caudad of spermathecal eminence, upper vaginal sclerite heavily pigmented, large and complex, covering most of vaginal roof; spermathecal eminence heavily pigmented, large, deep in depth, dorsal surface with a long basal extension covered with closely matted moderately long branched spiny excrescences, ventral outline heart-shaped with inner portion developed into a pair of very long slender cephalad produced arms; postgenital lobe short, moderately broad, apex with a moderately deep median indentation, 15-21 setae on each side of midline, completely covered with minute spicules, dorsal PGL index 0.90-1.02, ventral PGL index 1.31-1.56; peri-anal membrane with minute spicules; cercus triangular in shape, moderately long, broad at base, apex acute, completely covered with minute spicules, dorsal surface with numerous short and moderately long setae over apical 0.85-0.93, a few long setae at apex, 0-3 broad scales, ventral surface with short and moderately long setae on outer margin and becoming more numerous apically, cercus index 2.98-3.13, cercus/dorsal PGL index 2.66-2.84; 3 seminal capsules, 1 large, 1 medium and 1 small in size, heavily pigmented, ovoid, each with several small seminal capsule pores near orifice, base of accessory gland ducts unpigmented.

MALE. Differs from the female by the following features. *Head.* Antenna plumose, 0.86-0.97 length of proboscis; maxillary palpus 0.12-0.13 length of proboscis; proboscis 1.11-1.15 length of femur I. *Thorax.* Setal differences: scutal fossal (7-10 anterior, 4-5 lateral), scutellum (4-7 long and 3-6 short ones on lateral lobe, 4-7 long and 3-8 short ones on median lobe), 12-19 antepronotal, 4-6 postpronotal, 16-25 propleural, 5-9 postspiracular, 7-16 on prealar knob, 5-6 upper and 15-17 posterior mesepisternal, and 20-32 dorsad of scale patch on mesepimeron. *Legs.* Posttarsi I-III (Fig. 57) each with 2 ungues, I and II each with ungues unequal, larger one with a tooth, smaller one simple, III with ungues equal, both simple. *Genitalia* (Fig. 34). Distinctive as illustrated.

DISCUSSION. *Aedes virilis* is very similar to the other members of the *uncus* Group and no apparent differences could be found in the habitus by which to separate them. The female genitalia of *virilis* are similar to those of *latipennis* and *harrisonicus*, however, they can be separated from *latipennis* by the shape of sternum VIII which is without a posteriolateral lobe and the lower vaginal sclerite which has only a median indentation on the apical 0.35; from *harrisonicus* by the shape of the lower vaginal sclerite and the narrow base of the lower vaginal lip; and from all members of the *uncus* Group by the spermathecal eminence which has the inner portion produced into a pair of very long slender arms.

The male genitalia of *virilis* were partially illustrated by Edwards (1917: 222) but his drawing showed little detail. Delfinado (1968, Fig. 22) copied Edward's drawing. The genitalia were mounted on a celluloid point and were twisted, overdecolorized and very difficult to examine. I therefore stained, dissected and remounted the genitalia (preparation number T74.26) in Canada balsam on a microscope slide. The present illustration (Fig. 34) shows in detail the unique features of the genitalia of this species. Some distinctive features are: prosophallus very long, curved and slender; gonostylus long, elbowed, with a moderately long slender projection near middle; and gonocoxite with sternomesal surface with a median projection terminating in 2 apical claws (somewhat similar to *dux*).

The adult holotype male of *virilis* is unique for the subgenus in the presence of one long and one short seta on the median caudal area of the mesopostnotum. This feature has not been recorded in any other species of the genus *Aedes*; however, 2 genera (*Heizmannia* Ludlow and *Haemagogus* Williston) of the tribe Aedini (tribe as defined by Belkin 1962) possess this feature. The series of 13 males and 15 females from Sabah do not possess setae on the mespostnotum and I therefore consider their presence in the holotype to be an anomaly.

The above description is the first for the female of this species. The female genitalia (Fig. 18) and posttarsi (Fig. 61) and the male posttarsi (Fig. 57) are also illustrated for the first time.

TYPE-DATA. The holotype male in the BMNH contains labels which possess the following data in addition to that given by Delfinado (1968: 41): 26/2/04; Mosq. 58; Dr. G. F. Leicester; and 1912-350.

The holotype adult is in very poor condition but the genitalia are in excellent condition.

DISTRIBUTION. 30 specimens examined: 16♀, 14♂.

INDONESIA. *Sumatra*, Dermajoe (Benkoelen); 1♀ genitalia.

MALAYSIA. *Sabah*, Beaufort, Kg. Maraba, Sandakan; 15♀, 13♂. *Selangor*, Kuala Lumpur; 1♂ (holotype).

BIOLOGY. Adults were collected in Malaysia on a clear day resting in bushes of a rubber estate at 1410 hours and at an elevation of 76 m.

AEDES (VERRALLINA) YERBURYI EDWARDS

(Figs. 19, 57, 62)

The following information supplements the descriptions of Edwards (1917: 222) and Wijesundara (1951: 174).

FEMALE. *Head*. Antenna 1.03-1.05 length of proboscis; maxillary palpus 0.19 length of proboscis; proboscis 1.08-1.13 length of femur I. *Thorax*. Following setae present: 4-5 median anterior promontory; numerous acrostichal (anterior and posterior); numerous dorsocentral (anterior and posterior); scutal fossal (3-4 anterior, 4-6 lateral and 1-2 posterior); numerous supra-alar; 4 posterior medial scutal; 1 postalar callar; scutellar (6-7 long and 2-4 short ones on lateral lobe, 5-6 long and 3-6 short ones on median lobe); 14-19 antepronotal; 5-6 postpronotal; 15-17 propleural; 3-6 postspiracular; 4-6 upper and 8-11 posterior mesepisternal; 10-16 on prealar knob; and mesepimeron with 10-15 dorsad of scale patch, several short golden hairs near lower posterior corner of scale patch. Prosternum, subspiracular area, paratergite, mesomeron and metameron bare. *Legs*. Posttarsi I-III (Fig. 62) each with 2 ungues, I and II with ungues equal, each with a tooth, III with ungues equal, both simple. *Wing*. Remigium with 2 setae. *Genitalia* (Fig. 19). Very large and expanded.

MALE. Habitus similar to female. *Head*. Antenna plumose, 0.91 length of proboscis; maxillary palpus 0.18 length of proboscis; proboscis 1.14 length of femur I. *Legs*. Posttarsi I-III (Fig. 57) each with 2 ungues, I and II with ungues unequal, larger one with a tooth, III with ungues equal, both simple. *Genitalia*. Extremely large and expanded.

DISCUSSION. Adults resemble *uncus* but can be separated from this species by the reduced number of golden hairs located caudad of the lower corner of the mesepimeral scale patch.

DISTRIBUTION. 11 specimens examined: 8♀, 3♂.

SRI LANKA. *North Central*, Anuradhapura District, Padaviya; 1♂. *Northern*, Vavuniya District, Parayanalankulam, 25 miles NW. of Medawachchiya; 8♀, 2♂.

BIOLOGY. Adults were collected at an elevation of 55 m.

AEDES (VERRALLINA) YUSAFI BARRAUD
(Figs. 20, 22, 35, 47, 57, 62)

Aedes (*Neomacleaya*) *siamensis* Delfinado 1968, Contrib. Am. Entomol. Inst. (Ann Arbor) 2(4): 36 (♀*, ♂*, P, L*). NEW SYNONYM.

Aedes yusafi is the representative species for Section B and is therefore completely redescribed below.

FEMALE. *Head*. Antenna dark brown, 1.11-1.21 length of proboscis, pedicel dark brown with a few small pale brown scales mesally, flagellomere 1 with basal 0.65-0.80 pale and with several small brown scales near middle, flagellar whorls with 6 dark setae; clypeus dark brown, bare; maxillary palpus blackish-brown scaled, 4 segmented, 0.19-0.21 length of proboscis; proboscis blackish-brown scaled, 1.05-1.19 length of femur I; eyes well separated in front; ocular setae blackish-brown and moderately long; scales on head all broad, decumbent and blackish-brown except for a few short erect forked blackish-brown scales on occiput and a very few similar ones caudad of ocular setae, interocular space covered with broad silvery scales, similar scales extending caudally onto vertex for a very short distance and laterally a short distance on ocular line, broad silvery scales also forming a broad stripe from area in front of antepronotum to ocular line on upper lateral surface, and postgenal scales pale brown. *Thorax*. Scutal integument dark brown; scutum covered with narrow curved reddish-black scales except for a small patch of narrow curved white scales on median anterior promontory area, a few similar scales on anterior and lateral scutal fossal areas and at scutal angle; prescutellar space bare; scutellum with a patch of narrow curved white scales on each lobe, median lobe also usually with a few narrow curved brown scales basally; dark reddish-black setae on the following areas: 2-4 median anterior promontory, acrostichal (anterior and posterior), numerous dorsocentral (anterior and posterior), scutal fossal (3-6 anterior, 4-8 lateral and 1-2 posterior), numerous supra-alar, 4-5 posterior medial scutal, 1 postalar callar and scutellar (5-8 long and 3-5 short ones on lateral lobe, 4-6 long and 4 short ones on median lobe); pleural integument dark brown; antepronota widely separated, covered with broad silvery scales, 9-12 long and short dark setae; postpronotum with 5-8 posterior golden-brown setae; propleuron with a patch of broad silvery scales, 6-8 golden setae; prosternum, subspiracular area, paratergite, mesomeron and metameron bare; postspiracular area covered with broad silvery scales, 3-5 golden setae; mesepisternum with an upper and a lower patch of broad silvery scales, 6-8 posterior golden setae; prealar knob with 6-12 golden setae; mesepimeron with a large patch of broad silvery scales near middle, 8-11 golden setae dorsad of scale patch. *Legs*. Coxae I-III each with several golden-brown setae and a patch of broad silvery scales, I and II each with scales on anterior surface, III with a narrow band of scales on anterior margin and forming a broad patch dorsally; trochanters I-III each with several broad pale scales and a few short pale setae; femora I and II each with anterior surface brown scaled and with white scales forming a narrow basal band, I with white scales also on dorsobasal area, II also with a narrow longitudinal stripe of white scales extending from base to near apex, III with anterior and posterior surfaces white scaled with dorsoapical area brown scaled, I and II each with posterior surface white scaled with a narrow longitudinal brown scaled stripe from base to apex, stripe ventral on I and dorsal on II; tibiae I-III each dark brown scaled, I also with a posteroventral longitudinal white scaled stripe extending from base to apex, II also with posterior surface white scaled; tarsi I-III each dark brown scaled; posttarsi I-III (Fig. 62) each with 2 ungues, I, II and III each with ungues equal, each with a tooth. *Wing.* Dorsal and ventral veins with brown scales, costa also with a few white scales at base and remigium with a few white scales on posterior margin; alula with several narrow brown scales on margin; upper calypter with several golden hairs on margin; 1 remigial seta. *Halter.* Pedicel pale; capitellum dark brown scaled. *Abdomen.* Terga blackish-brown scaled, laterotergite of I with a large rectangular patch of white scales, II-VII each with a large, laterobasal patch of white scales which extend slightly onto tergal surface; sternum II white scaled; sterna III-VII white scaled with a broad apical band of brown scales, VII with white scaled area reduced; terga and sterna with numerous golden setae, mostly along posterior margins. *Genitalia* (Figs. 20 and 22). Tergum VIII moderately pigmented, base slightly concave, apex straight, several short and moderately long setae apically, numerous short setae scattered over apical 0.77-0.88, basolateral seta absent, covered with minute spicules, numerous broad scales covering apical 0.50-0.65, basal 0.2-0.7 retracted into segment VII, VIII-Te index 0.70-0.79, VIII-Te/IX-Te index 2.67-2.85; sternum VIII moderately pigmented with apical 0.35-0.39 darker, base concave mesally, apex with a moderately deep median indentation with a small lobe on each side of midline, numerous short stout setae on lobes, numerous short and a few moderately long setae scattered over entire surface except basal 0.09-0.14 and a small basolateral area, covered with minute spicules, a number of broad scales forming a lateroapical patch, apical intersegmental fold unpigmented, VIII-S index 0.67-0.73; tergum IX moderately pigmented with basomedian area lightly pigmented, wide, short, base concave, apex with a wide moderately deep median indentation and with 1-4 (usually 3-4) short setae apically on each side of midline, covered with minute spicules, IX-Te index 0.46-0.49; insula absent, however, median apical U-shaped portion of lower vaginal sclerite apparently serves in the capacity of the insula since it is situated in its normal position and lies in the space between the apical median lobes of VIII-S; lower vaginal lip lightly to moderately pigmented, forming a narrow band along basal 0.75 of area, apical 0.25 not developed, base attached near midpoint of lateral portion of upper vaginal lip, covered with small spicules, lower vaginal sclerite forming a heavily pigmented ribbon-like strip attached to lower vaginal lip, extending around lower vaginal membrane and fused at apex forming a projected wrinkled U-shaped structure, sclerite apparently replaces apical 0.25 of lower vaginal lip and insula, base of sclerite articulates with the lateral wing-like projection of the spermathecal eminence "pouch"; upper vaginal lip moderately pigmented, narrow, median posterior portion lightly pigmented as base and projected into a large heavily pigmented cephalic shield which covers posterior portion of spermathecal eminence, ventral surface of shield attached to caudal surface of spermathecal eminence, upper vaginal sclerite moderately pigmented, very large, well developed, base attached along entire lateral margin of upper vaginal lip and with a heavily pigmented apodeme extending from lateroposterior margin of upper vaginal lip to anterior mesal area; spermathecal eminence heavily pigmented, shallow in depth, egg-shaped in dorsal outline, a heavily pigmented cephalad produced pouch attached to anterior tergal portion of spermathecal eminence, pouch with inner surface lined with numerous hair-like spicules and with a laterobasal wing-like structure on each side; postgenital lobe short, narrow, apex flat to broadly rounded, 8-10 setae on each side of midline, completely covered with small spicules, dorsal PGL index 0.96-1.24, ventral PGL index 1.69-1.96; peri-anal membrane with minute spicules; cercus triangular in shape, moderately long and broad at base, apex acute, completely covered with small spicules, dorsal surface with a number of moderately long and a few short setae on apical 0.91-0.95, ventral surface with a few short setae along outer area, a number (12 or more) of broad scales on apical 0.75-0.84 of dorsal surface, cercus index 3.10-3.28, cercus/dorsal PGL index 3.10-3.65; 3 seminal capsules, 1 large, 1 medium and 1 small in size, heavily pigmented, nearly spherical, a few seminal capsule pores near orifice, base of accessory gland duct lightly to moderately pigmented.

MALE. Similar to female in general habitus but with the following differences. *Head.* Antenna plumose, whorls with 8 setae, 1.15-1.27 length of proboscis; maxillary palpus 0.15-0.17 length of proboscis; proboscis 1.01-1.11 length of femur I. *Thorax.* Scutellum with narrow curved brown scales on each lobe, setae (4-5 long and 2-3 short ones on lateral lobe, 4 long and 2-3 short ones on median lobe); 5-9 antepronotal setae; 3-5 postpronotal setae; 4-5 propleural setae; 1-2 postspiracular setae; 4-5 posterior mesepisternal setae; 4-7 prealar knob setae; 3-7 mesepimeral setae dorsad of scale patch. *Legs.* Tibiae I-III each dark brown scaled; posttarsi I-III (Fig. 57) each with 2 ungues, I with ungues unequal, larger ungue with a tooth, II with ungues unequal, larger ungue with a tooth, III with ungues equal, one with a tooth. *Wing.* Costa and remigium without white scales. *Abdomen.* Terga with laterobasal white scaled spots small; sterna II-VII pale scaled, VIII brown scaled. *Genitalia* (Fig. 35). Tergum IX heavily pigmented, formed into a moderately broad band mesally and expanded laterally on each side into a triangular lobe, fused with tergum X, setae absent, connected laterally to sternum IX by a narrow heavily pigmented band; gonocoxite short, broad, heavily pigmented, tergobasal portion of mesal surface membranous with minute spicules, dorsal surface with a few short and moderately long setae, 1-2 long setae near base of gonostylus, ventral surface produced into a large apicomesal lobe which is heavily pigmented on both sternal and tergal areas, apex expanded into a small finger-like lobelet with a short seta near apex and 4-5 short setae at base, sternal area of lobe with 2 long stout setae at base of outer margin and several short setae over remainder of area, several broad scales on lateral and ventral surfaces of gonocoxite; gonostylus heavily pigmented, moderately long, approximately 0.6 length of gonocoxite, basal 0.28 moderately broad, middle 0.38 expanded and with 44-54 short setae, apical 0.34 narrow, recurved and with apex very heavily pigmented, gonostylar claw absent, attached subapically to gonocoxite; basal mesal lobe broad, moderately pigmented, covered with small spicules, 26-28 very short setae near center of lobe, 2 heavily pigmented short stout spine-like structures near middle of sternomesal margin, lobes connected mesally by a broad band which forms a shallow trough ventrad of apical portion of prosophallus, sternomesal and outer margins of basal mesal lobe fused with gonocoxite; proctiger with paraproct heavily pigmented, formed into a long arm which is moderately broad basally and with apical 0.45 acuminate and curved slightly mesad, dorsal surface with a few small spicules on basal 0.4 and a small heavily pigmented lump near middle at point where cercus attaches, sternobasal area of paraproct formed into a small broad projection which extends ventrad and articulates at a point on the dorsomesal surface of the parameral apodeme near base of opisthophallus, proctiger strongly fused with tergum X, cercus membranous and without cercal setae; tergum X heavily pigmented, formed into a plate between proctiger and caudolateral portion of tergum IX, not connected mesally; phallosome complex, opisthophallus--consists of a moderately pigmented tergal transverse bridge between the parameral apodemes, base attached to a dorsomesal extension of the caudal outer portion of paramere apodeme, located dorsad of phallus and prosophallus and ventrad of proctiger, phallus--consists of a pair of short heavily pigmented narrowly separated arms which are fused at base, sternolateral area of base extended into a long arm which is fused with tergomesal portion of prosophallus base, apex of phallus formed into a tergal penis filament which consists of a pair of long bars extending cephalad from phallus apex, bars connected by a narrow transverse bridge near middle, apical 0.5 of bars curved dorsad and attached to sternal surface of opisthophallus, prosophallus--consists of a pair of long heavily pigmented acuminate arms which have their bases widely separated and their apices contiguous, base of arm attached to tergomesal portion of paramere and located ventrad and laterad of phallus, apical portion of arm projecting caudad and dorsad of phallus, prosophalic arm approximately 2.63 length of phallic arm (measured along midline of genitalia), paramere--heavily pigmented, broad, long (approximately 2.32 length of phallic arm), articulates at 2 points near middle with caudal area of parameral apodeme, most inner point of apodeme attached to sternobasal area of prosophallic arm, parameral apodeme--moderately to heavily pigmented, very long (approximately 1.68 length of paramere), attached near middle of outer surface with tergobasal apodeme of gonocoxite; sternum IX heavily pigmented throughout, large, broad, strongly attached along lateral surfaces to sternomesal areas of gonocoxites, 2-8 short setae near center of caudal area.

PUPA (Fig. 47). Chaetotaxy as recorded in Table 14. Ocular plate with area of well developed cuticular facets. Metanotal plate and areas of cephalothorax heavily pigmented. *Respiratory trumpet.* Moderately pigmented; short; hair-like spicules on distal 0.40-0.43 of inner surface; index 3.00-4.13, average 3.58. *Abdomen.* Setae 6, 9-VII weakly developed; 4-VIII double to 4 branched; 9-VIII single or double. *Paddle.* Ovoid; serrations on most of basal 0.85 of outer margin, minute proximally and well developed distally; minute spicules on apical 0.15 of outer and apical 0.09 of inner margins; midrib reaches apex; seta 1-P weakly developed, moderately long, single; index 1.27-1.47, average 1.34.

LARVA (Fig. 57). Chaetotaxy as figured and recorded in Table 27 and is based on 3 damaged, associated skins from the type-series of *siamensis*. *Head.* Seta 4-C triple to 4 branched; 5-C single or double; 6-C double or triple; 7-C double to 4 branched; 12-C single to 4 branched; dorsomentum with 29-34 teeth. *Antenna.* Short, lightly pigmented, with several small scattered spicules; seta 1-A short, thickened, single; 2-A long, with a subapical constriction; 3-A short, 0.27-0.31 length of 2-A; 4-A moderately long, 0.56-0.62 length of 2-A; 6-A short, 0.22-0.37 length of 2-A. *Abdomen.* Seta 1-VIII double or triple; 3-VIII with 4-8 branches; 5-VIII with 5-6 branches; 2-X triple or 4 branched, branches approximately equal in length; ventral brush with 8 setae on grid and 2 precratal shorter ones, all multiple branched; saddle moderately pigmented, incompletely rings segment X, acus absent; 4 moderately long anal papillae; comb with 8-12 scales arranged in a single slightly curved irregular row each scale with a stout median apical spine and small denticles on laterobasal areas. *Siphon.* Moderately pigmented; acus well developed; index 1.58-2.08, average 1.82; pecten on basal 0.56-0.58 of siphon, composed of 11-15 (usually 14) teeth, apical

1-2 teeth longer and wider spaced than remainder of teeth, each tooth long, slender and with a small stout ventral denticle near base; seta 1-S short, double to 4 branched, base attached on basal 0.67-0.68 of siphon distad of last pecten tooth.

DISCUSSION. I have compared the female holotype of *yusafi* with the holotype male, allotype and paratypes of *siamensis* and determine them to be conspecific. The female genitalia of this species are very distinctive in the shape of the median portion of the upper vaginal lip and the presence of several setae on tergum IX and therefore leaves no doubt about the synonymy or association of sexes, especially since both males and females of *siamensis* were reared from a batch of eggs from a wild caught female.

The holotype of *siamensis* was collected in 1967, according to the collection data sheet and adult label, but Delfinado (1968: 38) erroneously reported it collected in 1965.

Two male paratypes listed by Delfinado (1968: 38) could not be located in the USNM, SEAMP, BMNH or Bishop Museum and are presumed lost.

Posttarsus II of the holotype male of *siamensis* has the larger ungue with an abnormal double tooth and the second tooth on both the larger ungues of posttarsi I and II (paratype) are actually hair-like spicules (see Fig. 26, Delfinado 1968).

The male and female genitalia of all species in Section B are very distinctive and possess excellent characters for separating the species. Figures 21 and 22 compare the spermathecal eminence "pouch", median area of the upper vaginal lip and tergum IX of all the known members of this section. Tergum IX of the female genitalia of *yusafi* is distinctive in possessing several setae on each side of the midline.

Features of the adults of Section B are compared by Reinert (1973b: 257).

TYPE-DATA. *Aedes* (*Aedes*) *yusafi* Barraud, holotype female, genitalia mounted in Canada balsam on a microscope slide, INDIA, *Delhi*, Roshanara Garden, IV. 1914, S. R. Christophers collector, specimen number 2555, Mus. Reg. 930, B. M. 1935-622, genitalia preparation number T73.580, biting collection, and deposited in the BMNH. *Aedes* (*Neomacleaya*) *siamensis* Delfinado, holotype male, associated pupal skin and genitalia mounted in Canada balsam on microscope slides, THAILAND, *Lampang*, Ban Pong Tao, 21 April 1967, E. L. Peyton and Kol Mongkolpanya collectors, collection number 01998-103, reared from an egg obtained from a female which had fed on man; allotype with associated pupal and larval skins and genitalia mounted in Canada balsam on microscope slides, collection number 01998-3, other data same as holotype; paratypes, one male with associated pupal and larval skins, collection number 01998-2, 8 males with associated pupal skins, collection numbers 01998-100, 01998-101, 01998-102, 01998-104, 01998-105, 01998-107, 01998-108, 01998-109, one female with associated pupal and larval skins, collection number 01998-4, and one female with associated pupal skin, collection number 01998-106, other data same as holotype; paratypes, 12 females, collection number 01974, same data as holotype except for the following: collected feeding on man at 1000 hours, 21 April 1967, on a cloudy day near a medium size fresh water ground pool situated beneath a bamboo clump at an elevation of 200 m, females isolated and eggs deposited from which the 01998 series of specimens were reared (the above information about the types of *siamensis* was taken from the collection data sheets); the above types of *siamensis* are deposited in the USNM, BMNH and Bishop Museum.

DISTRIBUTION. 58 specimens examined: 32♀, 10♂, 13 with associated skins (10 p, 3 l).

INDIA. *Delhi,* Roshanara Garden; 1♀ (holotype of *yusafi*).

THAILAND. *Lampang,* Ban Pong Tao; 1♂ p (holotype of *siamensis*), 1♀ pl (allotype of *siamensis*), 1♀ pl, 1♀ p, 12♀, 1♂ pl, 8♂ p (all paratypes of *siamensis*), 16♀.

BIOLOGY. Numerous females in Thailand were collected biting man at 1000 hours, 21 April 1967, near a medium size ground pool containing fresh, unmoving water, located beneath a clump of bamboo and at an elevation of 200 m. The adults presumedly had emerged from the ground pool but no immatures could be found (E. L. Peyton, personal communication). Several of the blooded females were isolated and eggs obtained. The type-series of *siamensis* consists of specimens reared from these eggs and the above mentioned biting females.

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LIST OF FIGURE ABBREVIATIONS

Female Genitalia

AGDuB = Accessory gland duct base
Ce = Cercus
Ex = Spiny excrescences on SE
DPGL = Line of attachment of perianal membrane to dorsal surface of PGL
H = Hinge
I = Insula
IX-Te = Tergum IX
LVL = Lower vaginal lip
LVS = Lower vaginal sclerite
PGL = Postgenital lobe
SCa = Seminal capsule
SCaP = Seminal capsule pore
SE = Spermathecal eminence
Tu = Tuberculus
UVL = Upper vaginal lip
UVS = Upper vaginal sclerite
VIII-S = Sternum VIII
VIII-Te= Tergum VIII

Male Genitalia

BML = Basal mesal lobe
Gc = Gonocoxite
Gs = Gonostylus
IX-S = Sternum IX
IX-Te = Tergum IX
OP = Opisthophallus
PaA = Parameral apodeme
Par = Paramere
PH = Phallus
PO = Prosophallus
Ppr = Paraproct
Pr = Proctiger
X-Te = Tergum X

Pupa

CT = Cephalothorax
I-VIII = Abdominal segments I-VIII
MP = Metanotal plate
P = Paddle
T = Respiratory trumpet

Larva

A = Antenna
C = Head
CS = Comb scale
Dm = Dorsomentum
I-VIII, X = Abdominal segments I-VIII, X
M = Mesothorax
P = Prothorax
PT = Pecten tooth
S = Siphon
T = Metathorax

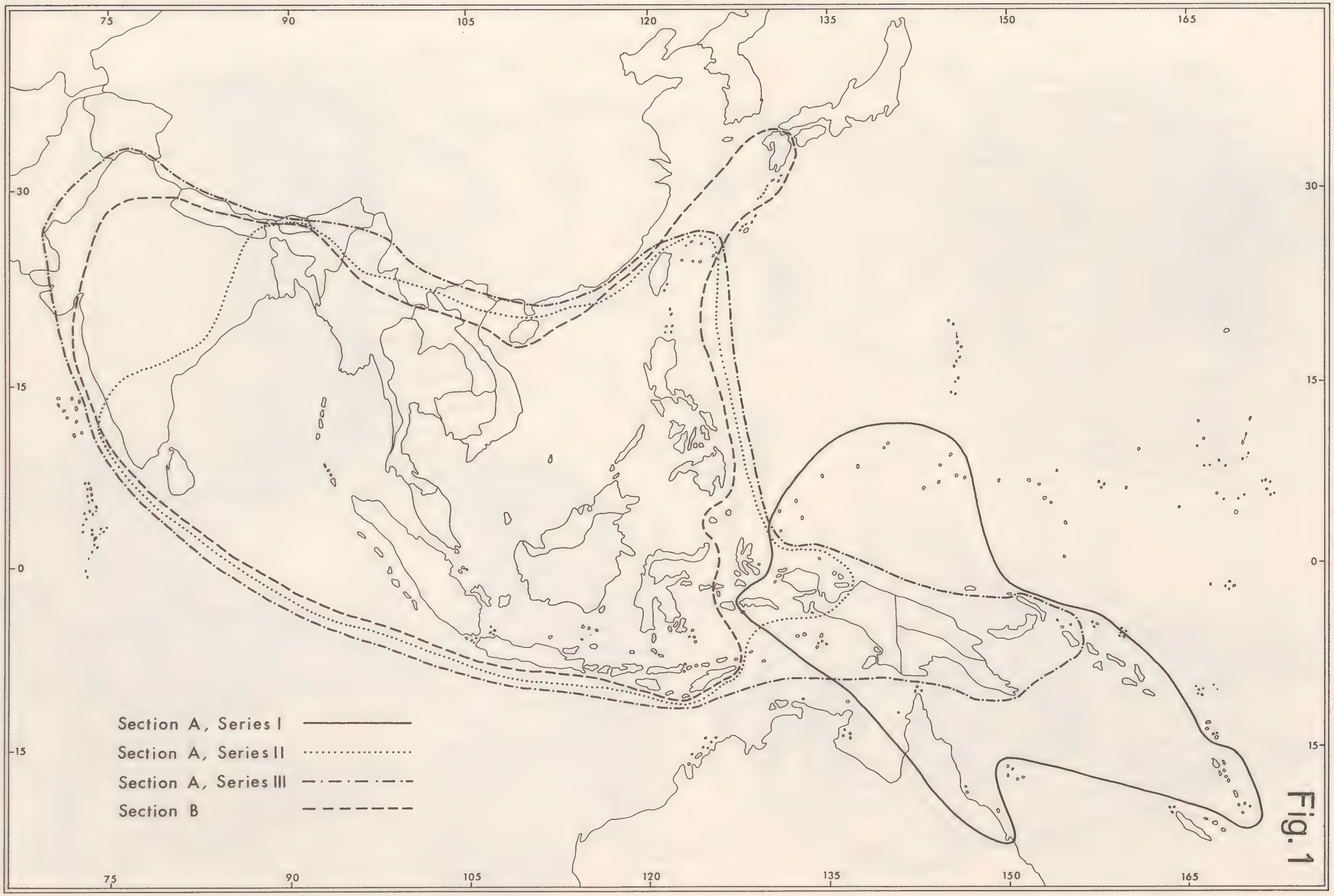
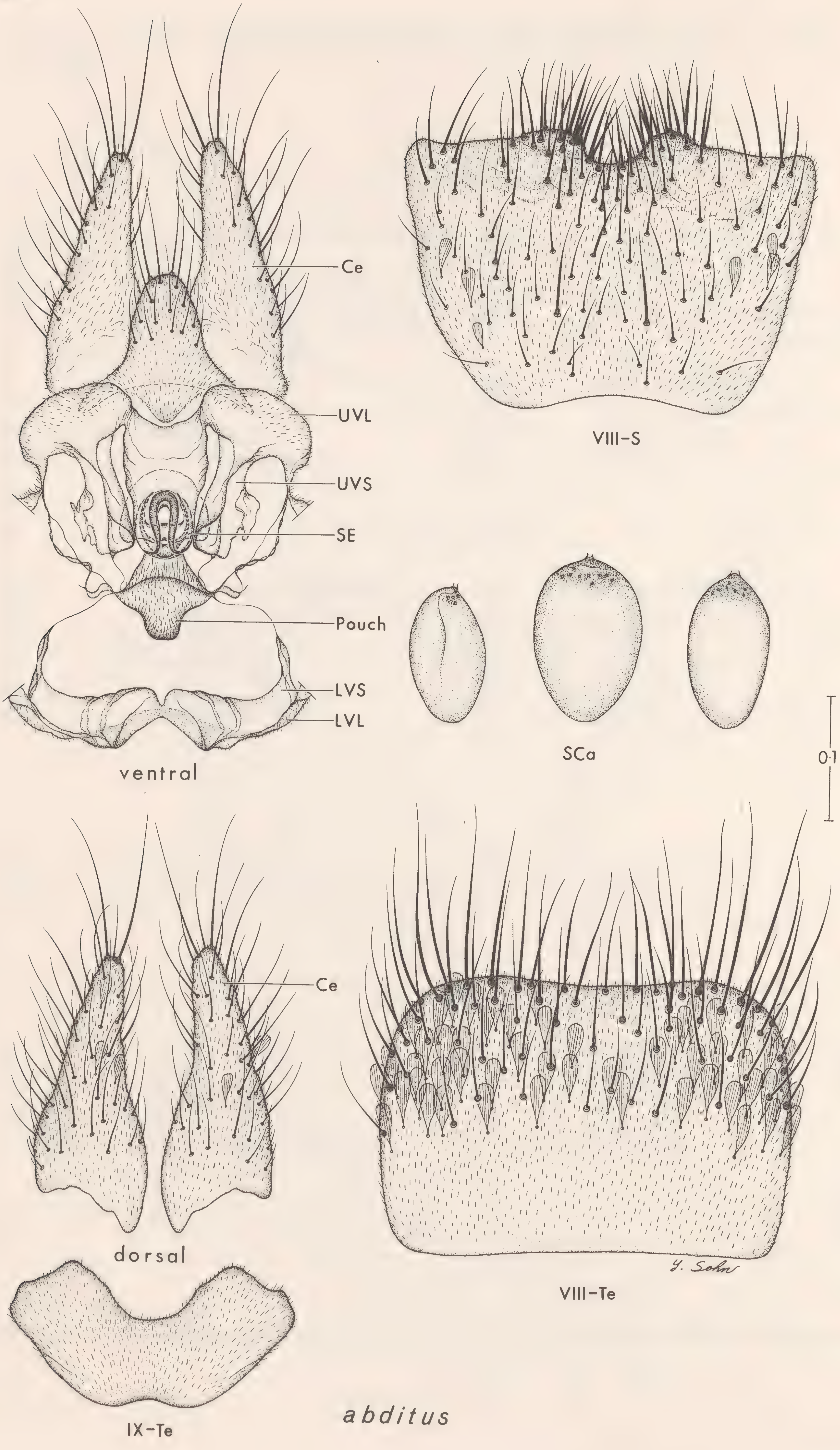


Fig. 1

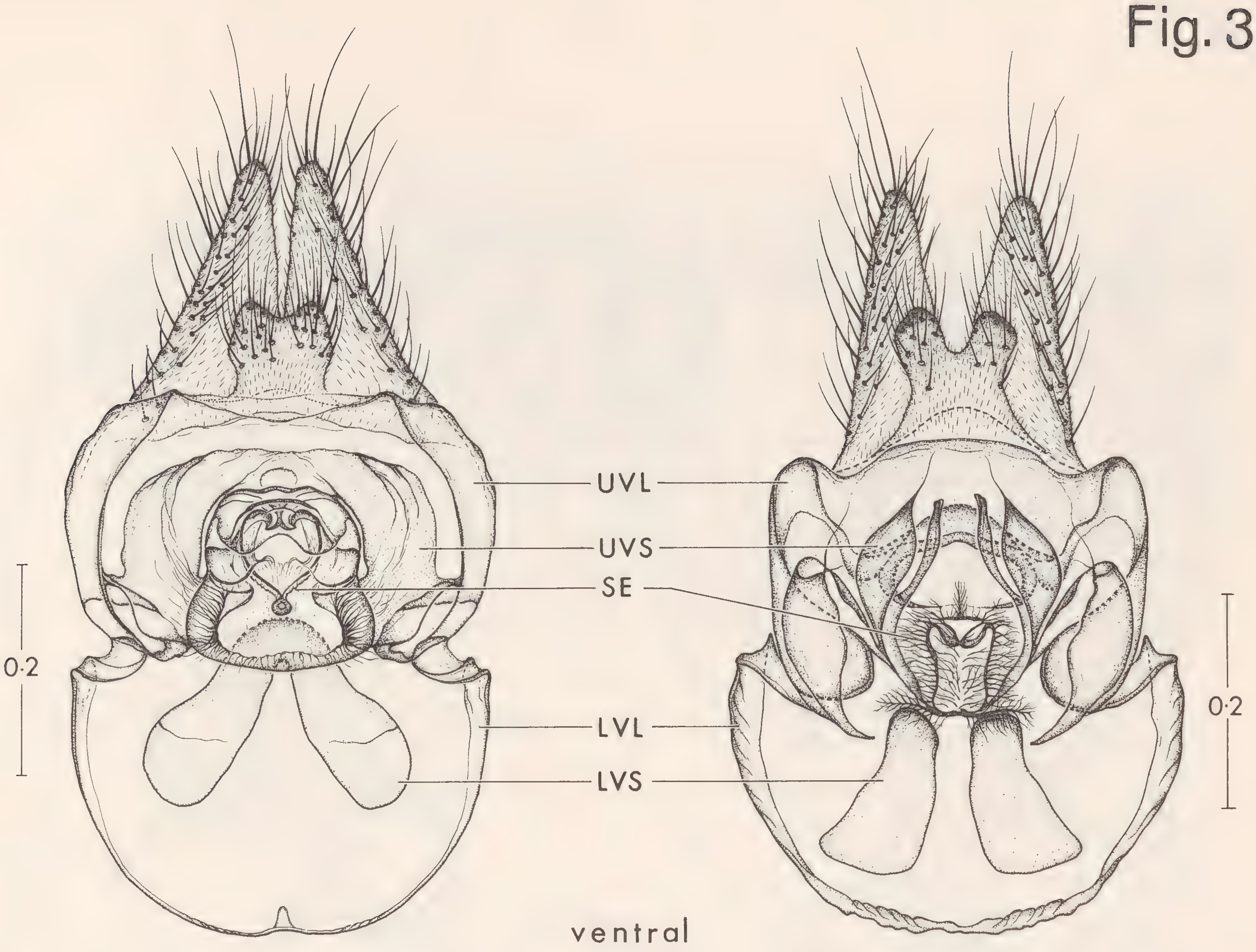
75
90
105
120
135
150
165
30
15
0
15
Section A, Series I
Section A, Series II
Section A, Series III
Section B

Fig. 2



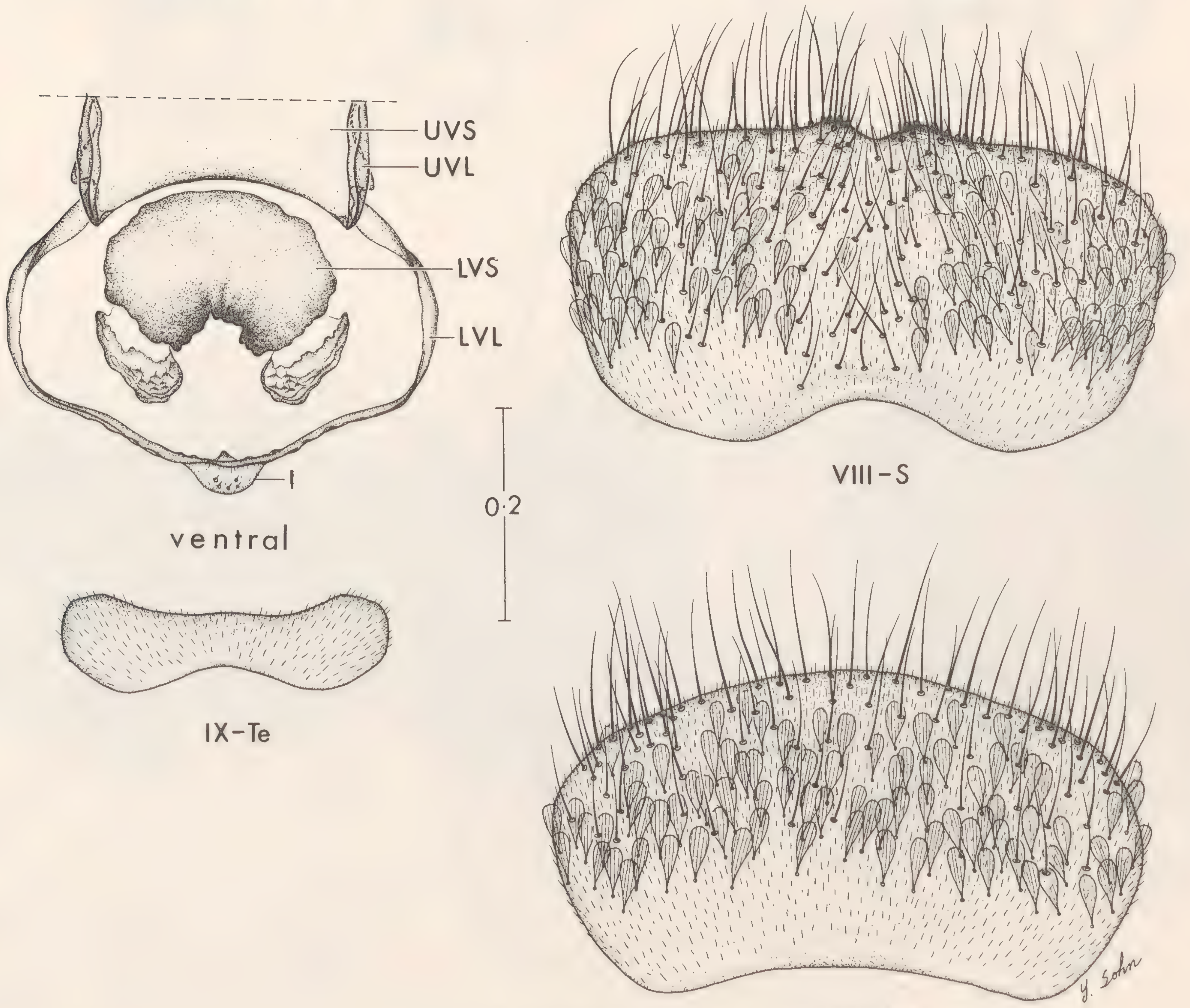
abditus

Fig. 3



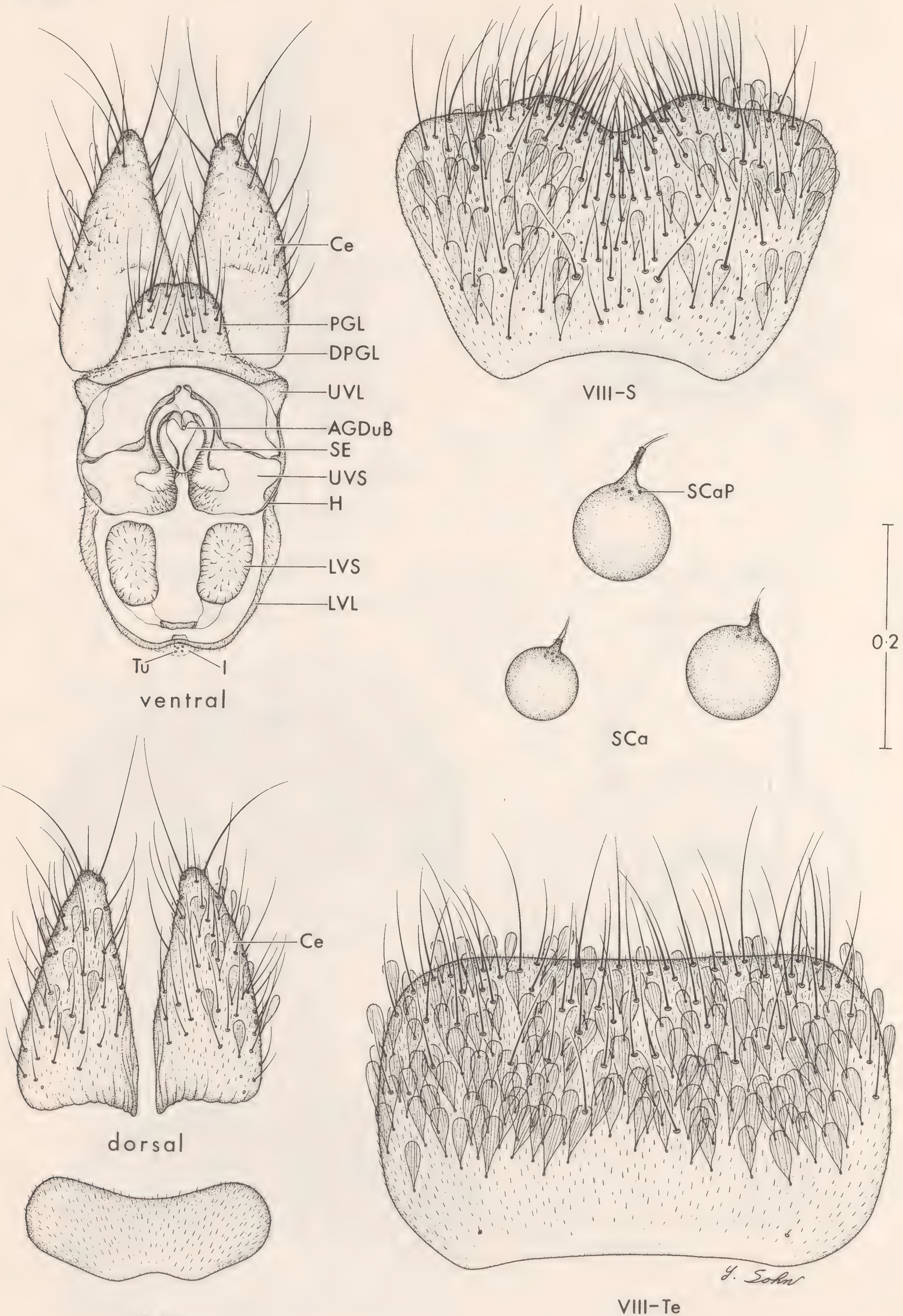
agrestis

comatus



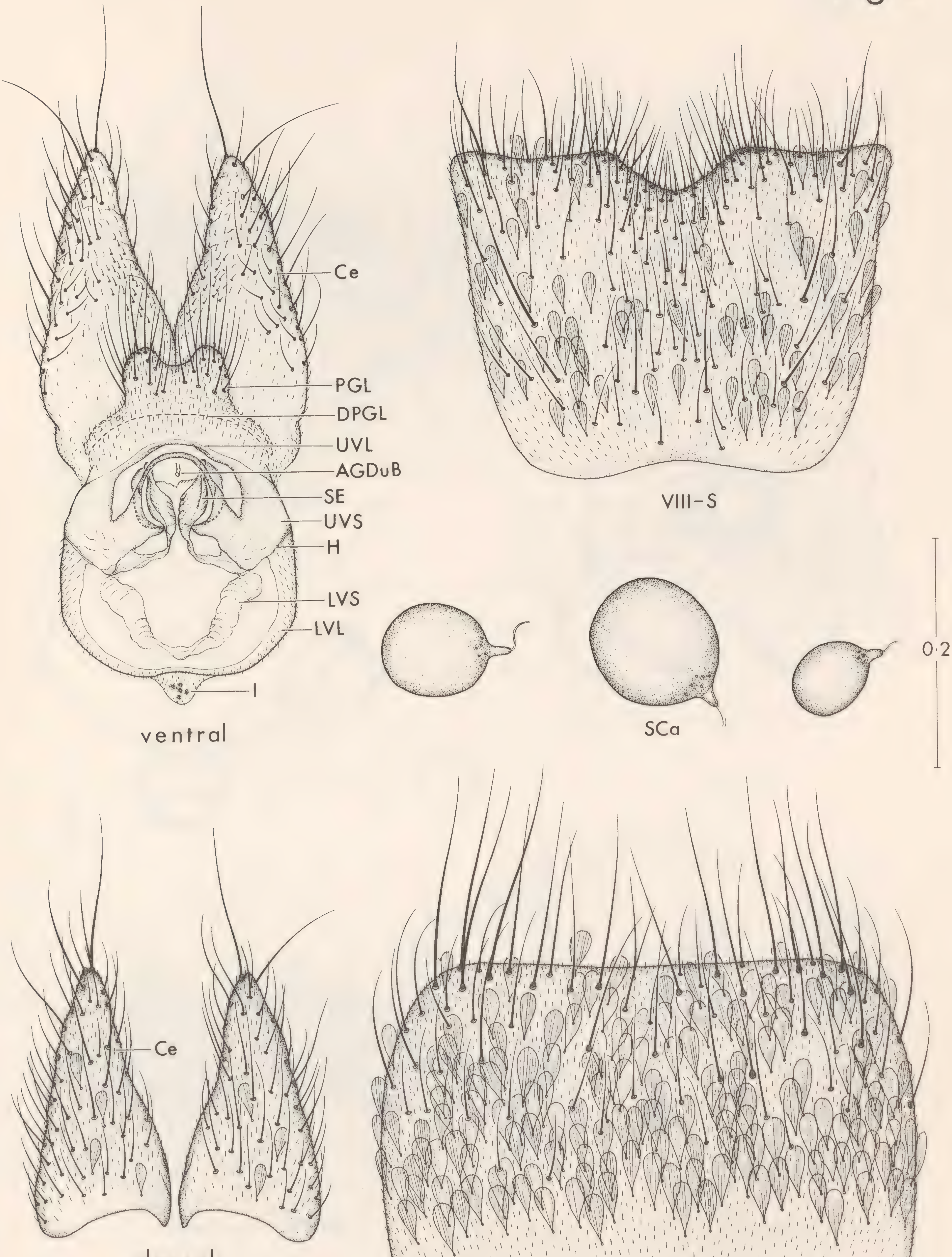
nigrotarsis

Fig. 4



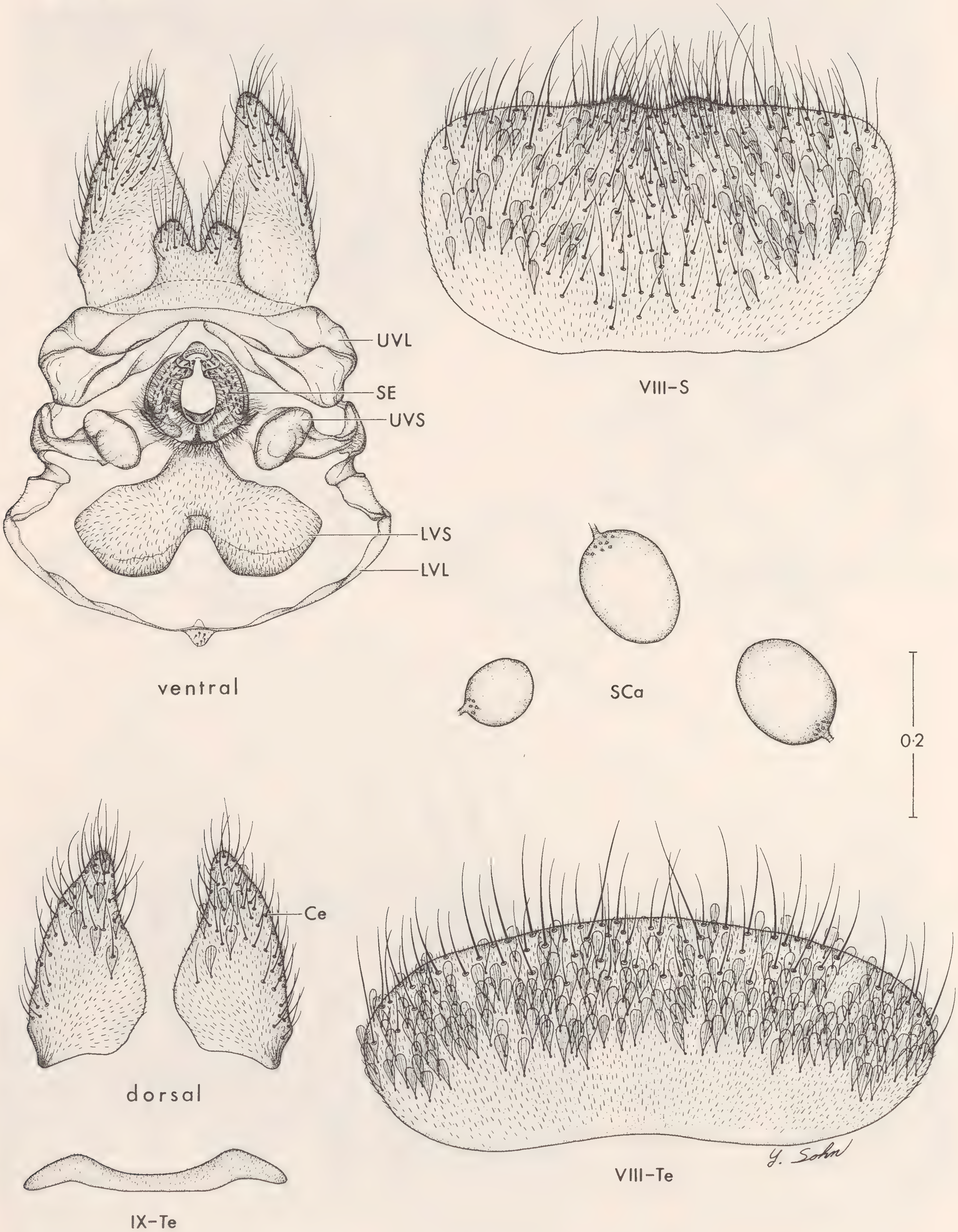
butleri

Fig. 5



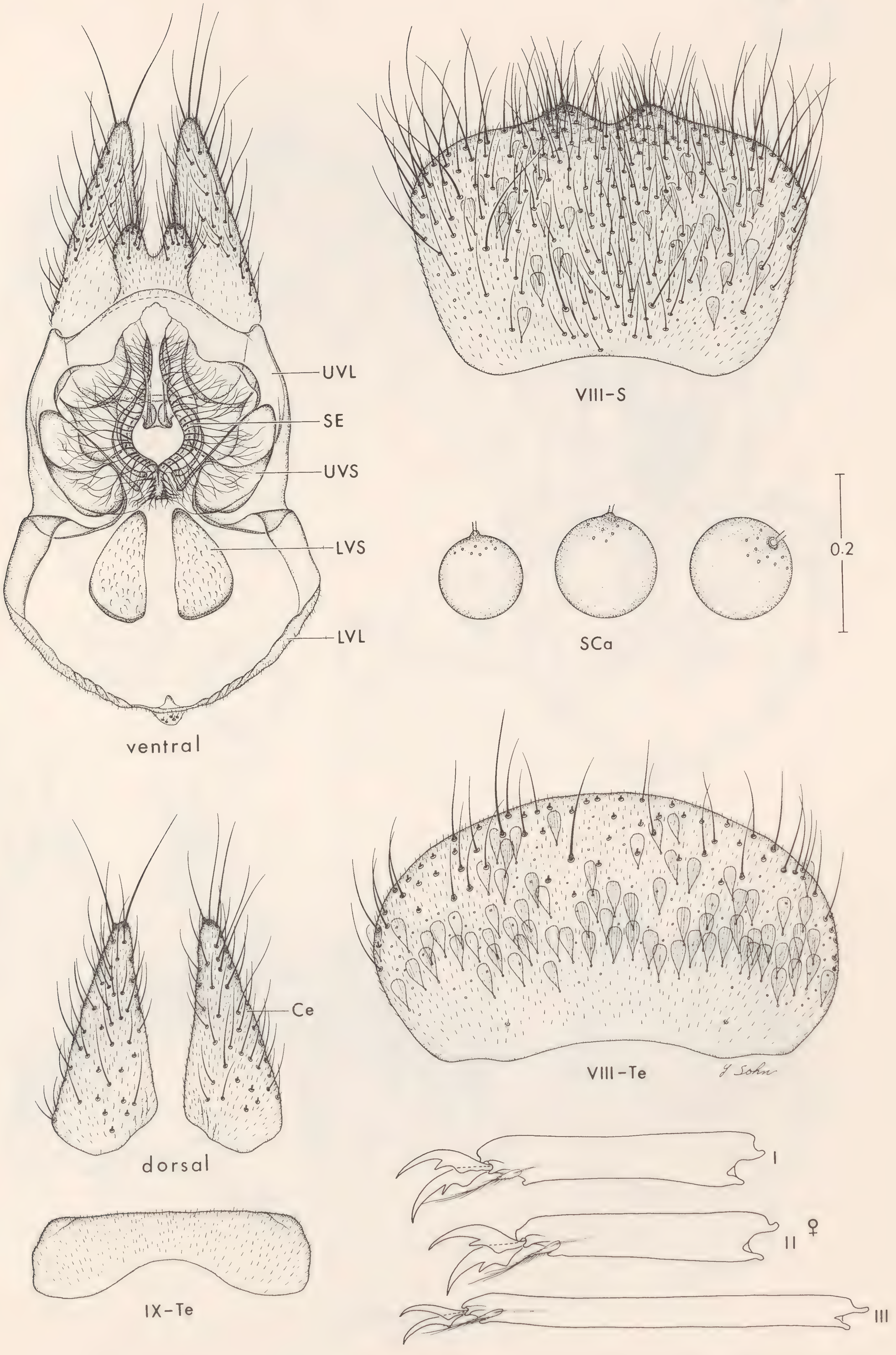
carmenti

Fig. 6


UVL
SE
UVS
LVS
LVL
ventral
VIII-S
SCa
0·2
Ce
dorsal
IX-Te
VIII-Te
Y. Sohn

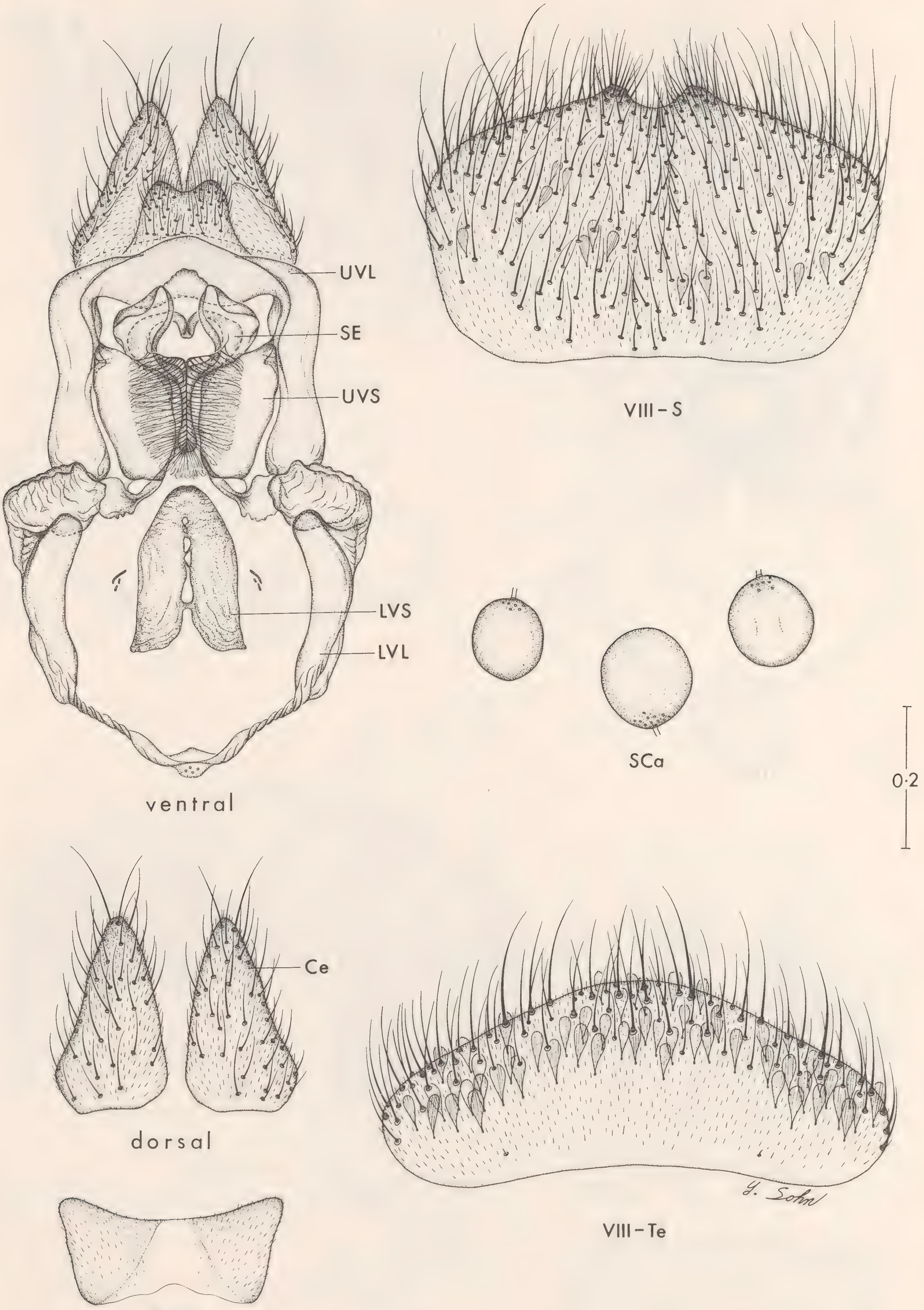
cautus

Fig. 7



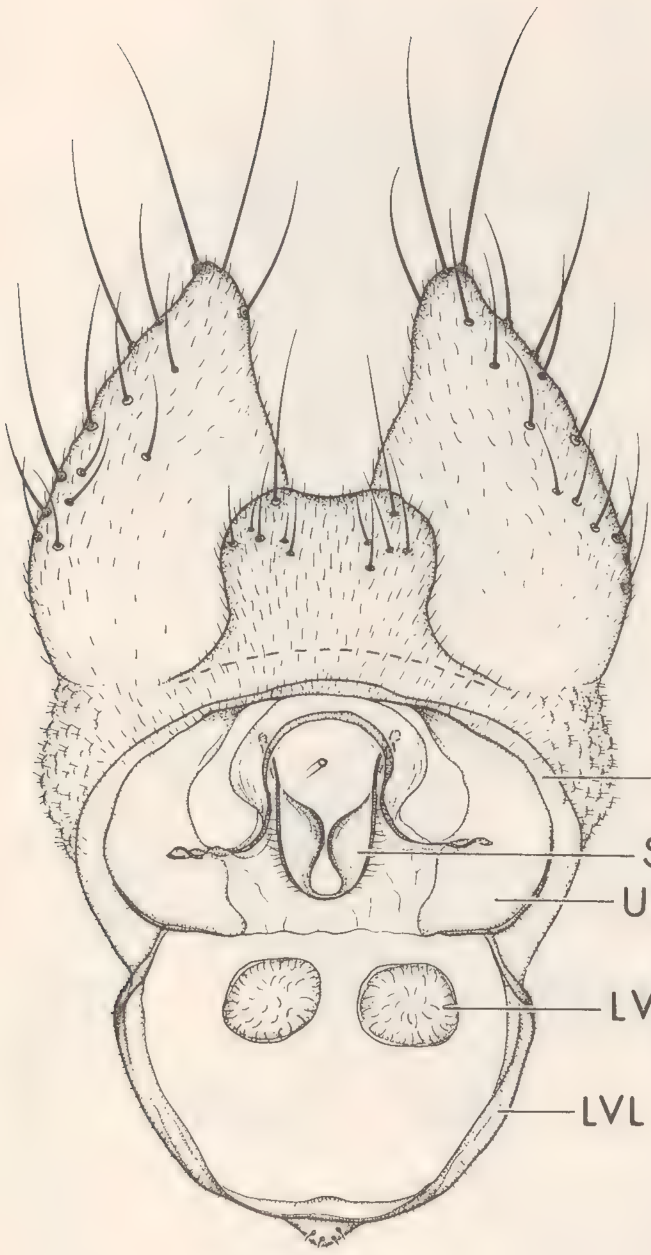
comosus

Fig. 8

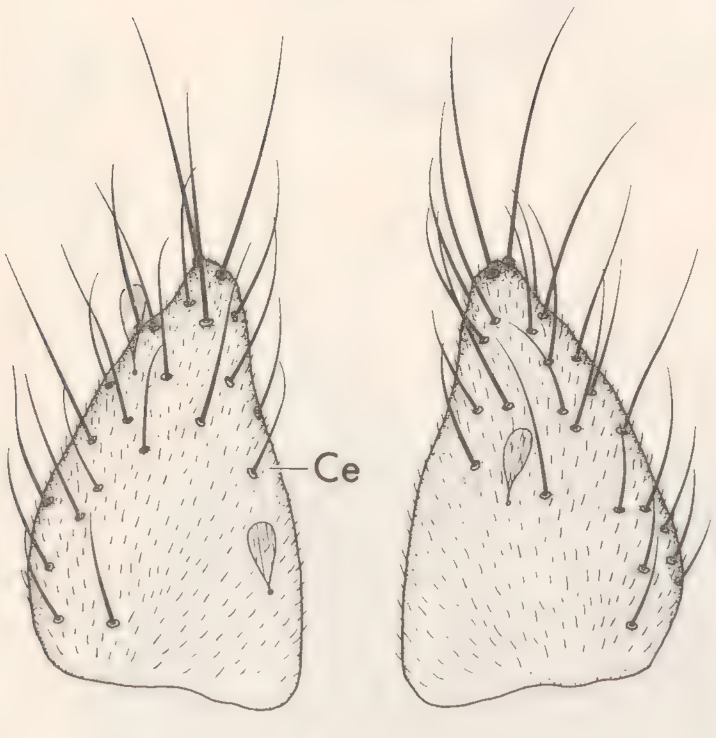


harrisonicus

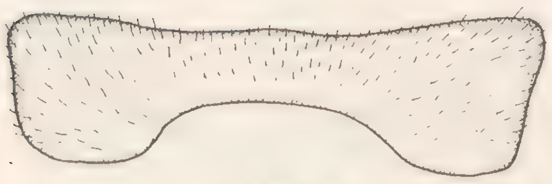
Fig. 9



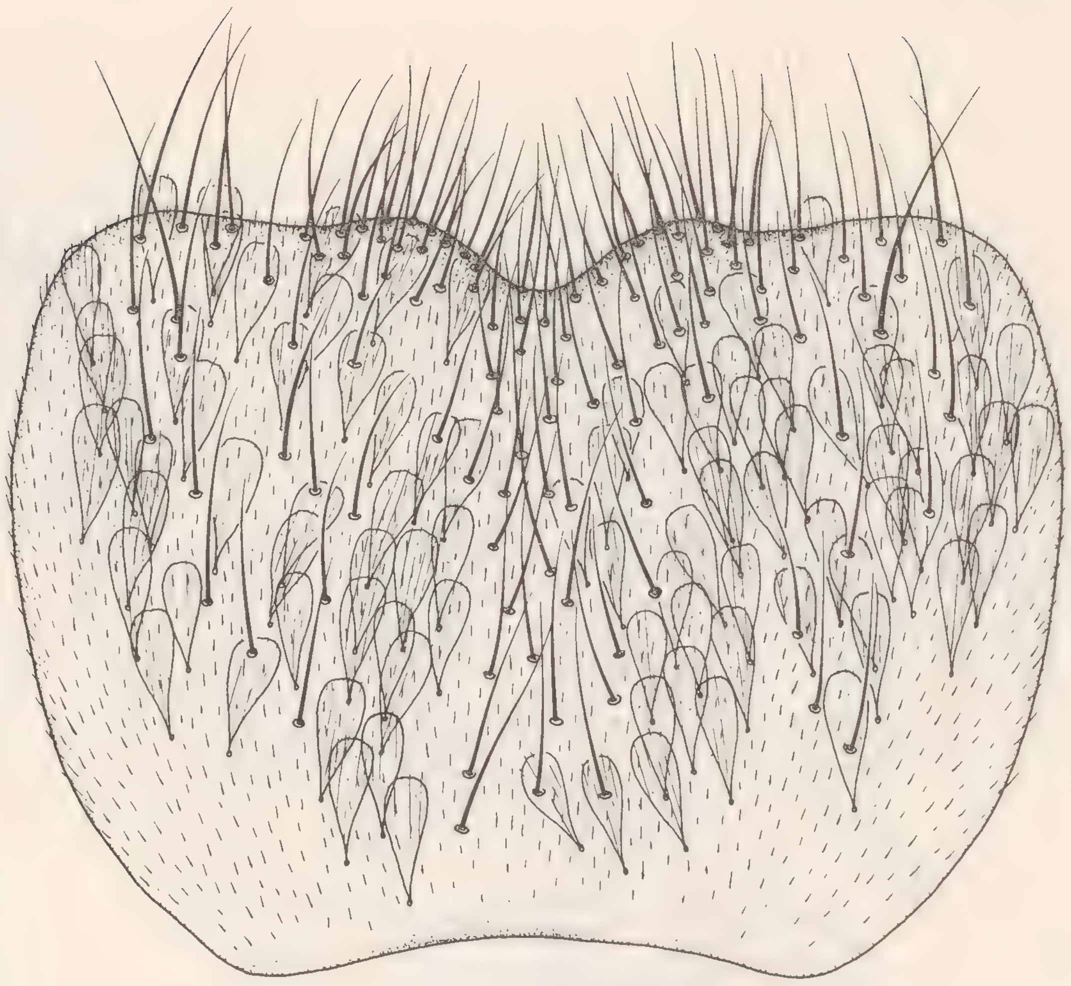
ventral



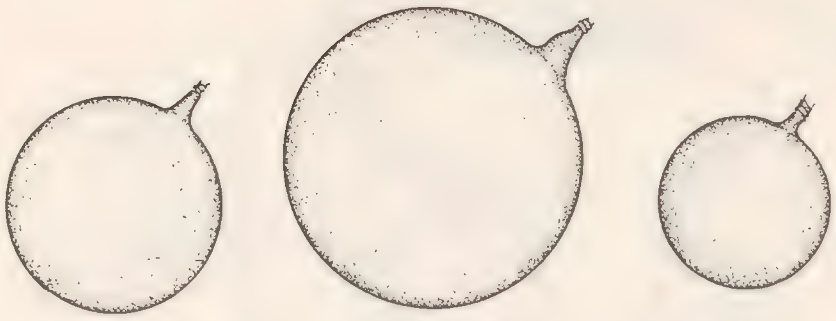
dorsal



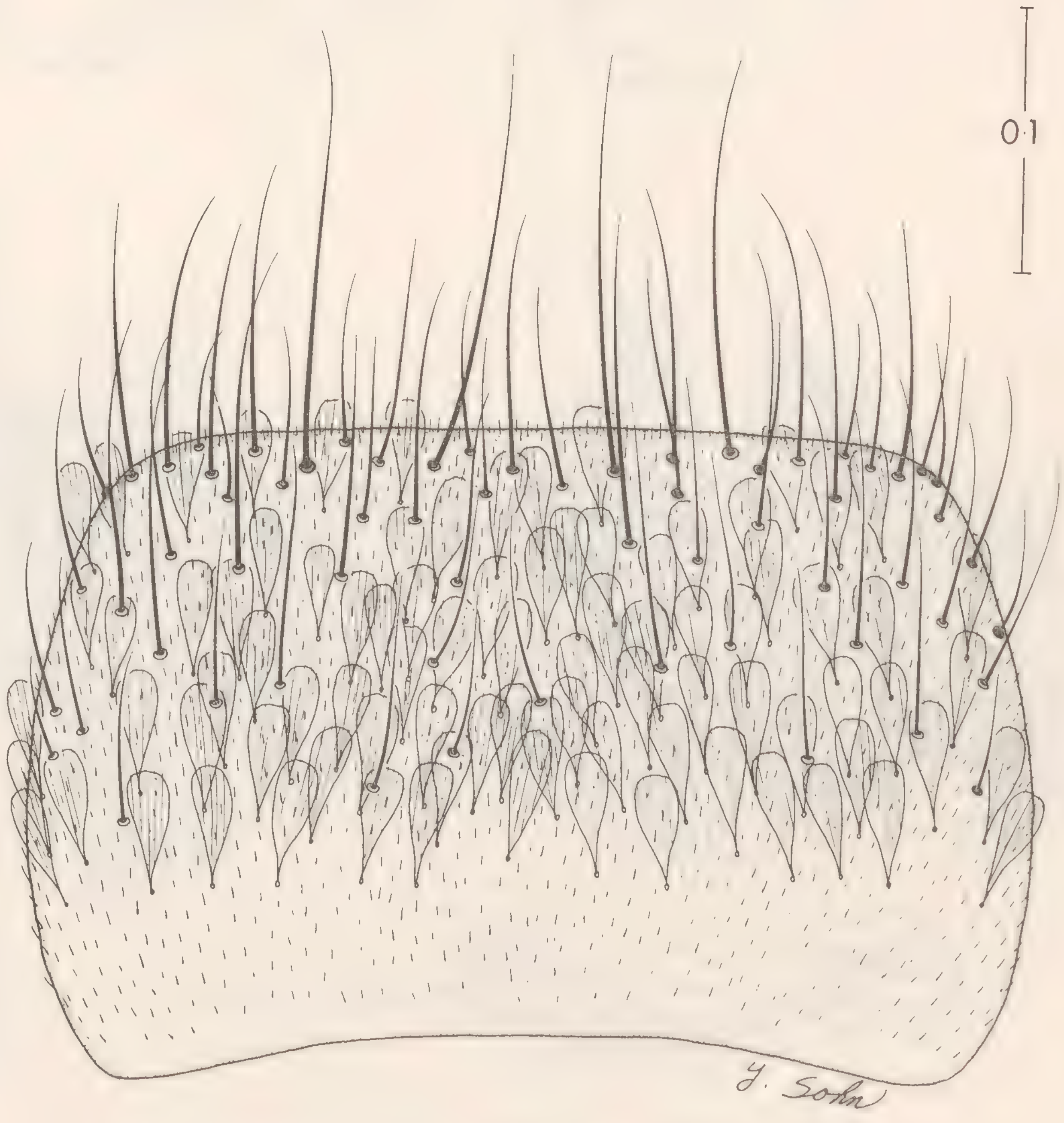
IX–Te



VIII–S



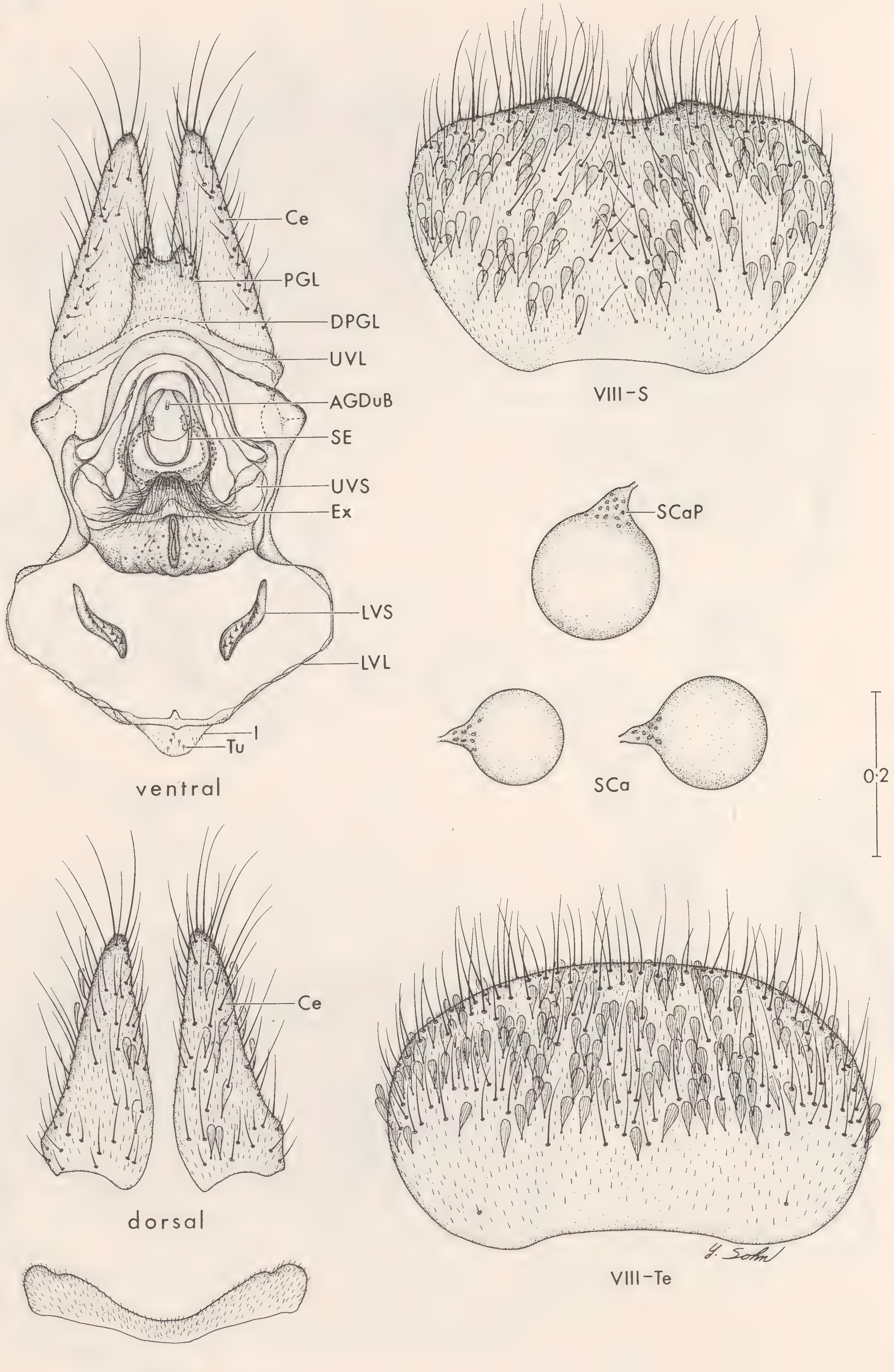
SCa



VIII–Te

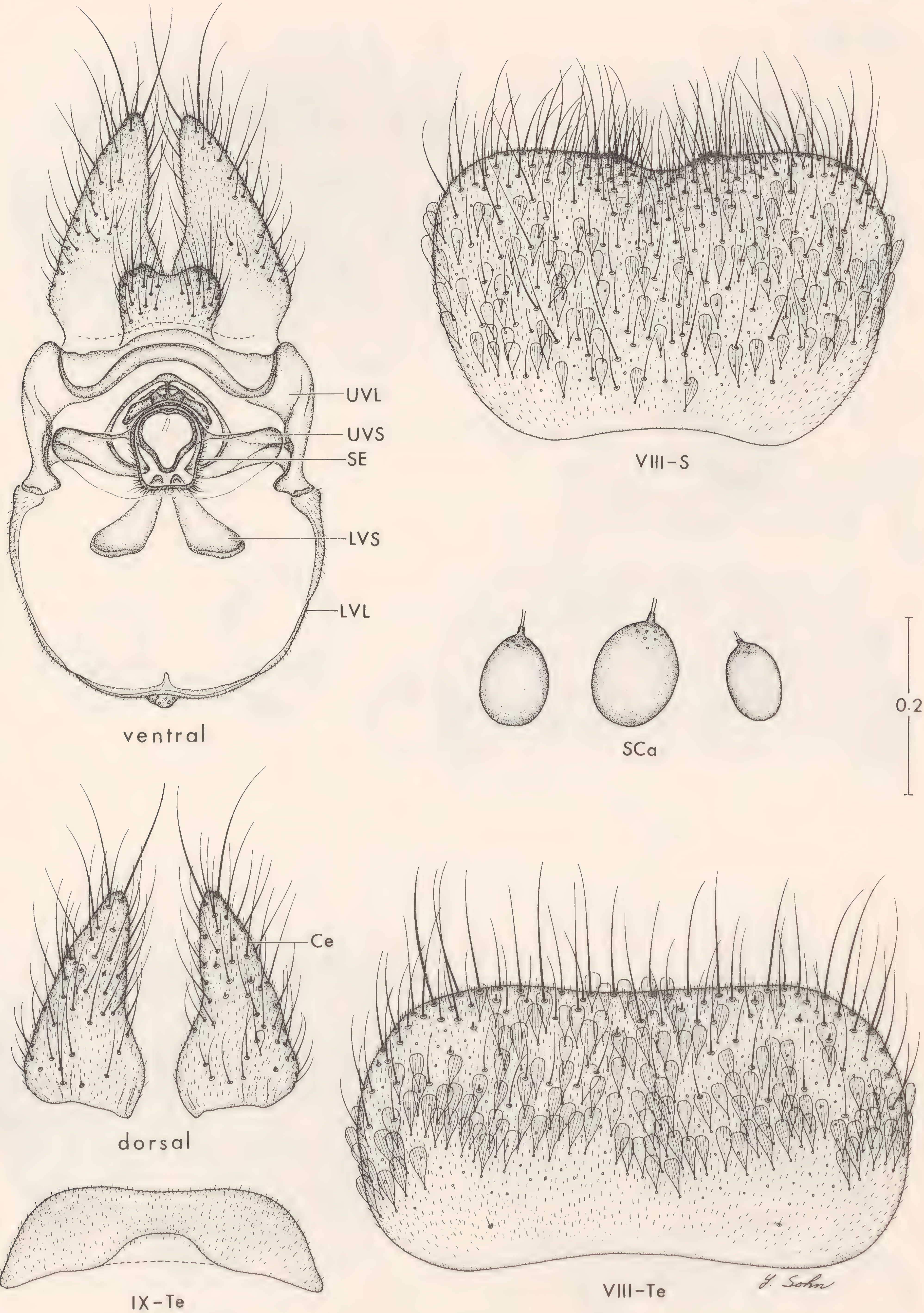
incertus

Fig. 10



indicus

Fig. 11



ventral

VIII-S

SCa

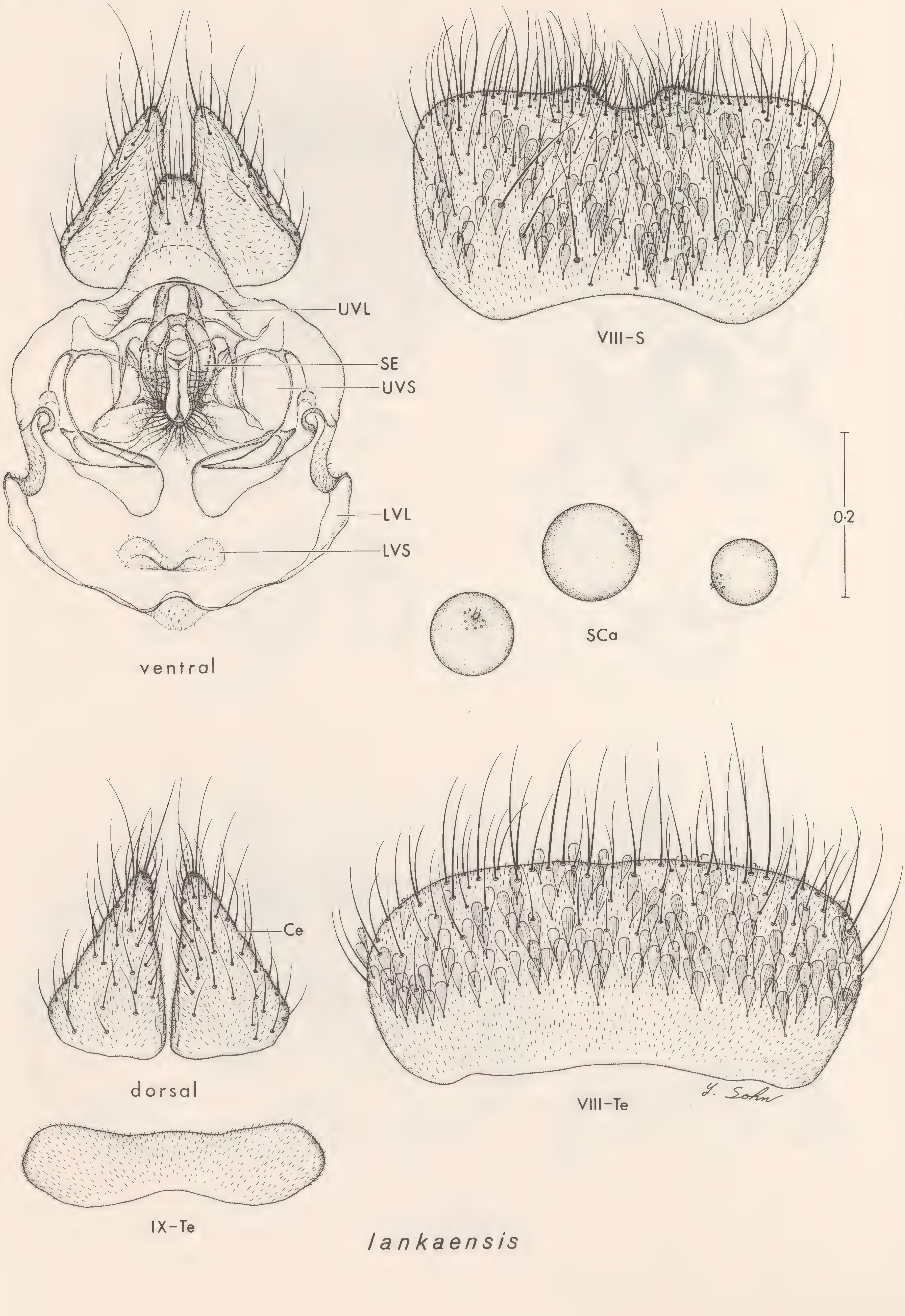
dorsal

IX-Te

VIII-Te

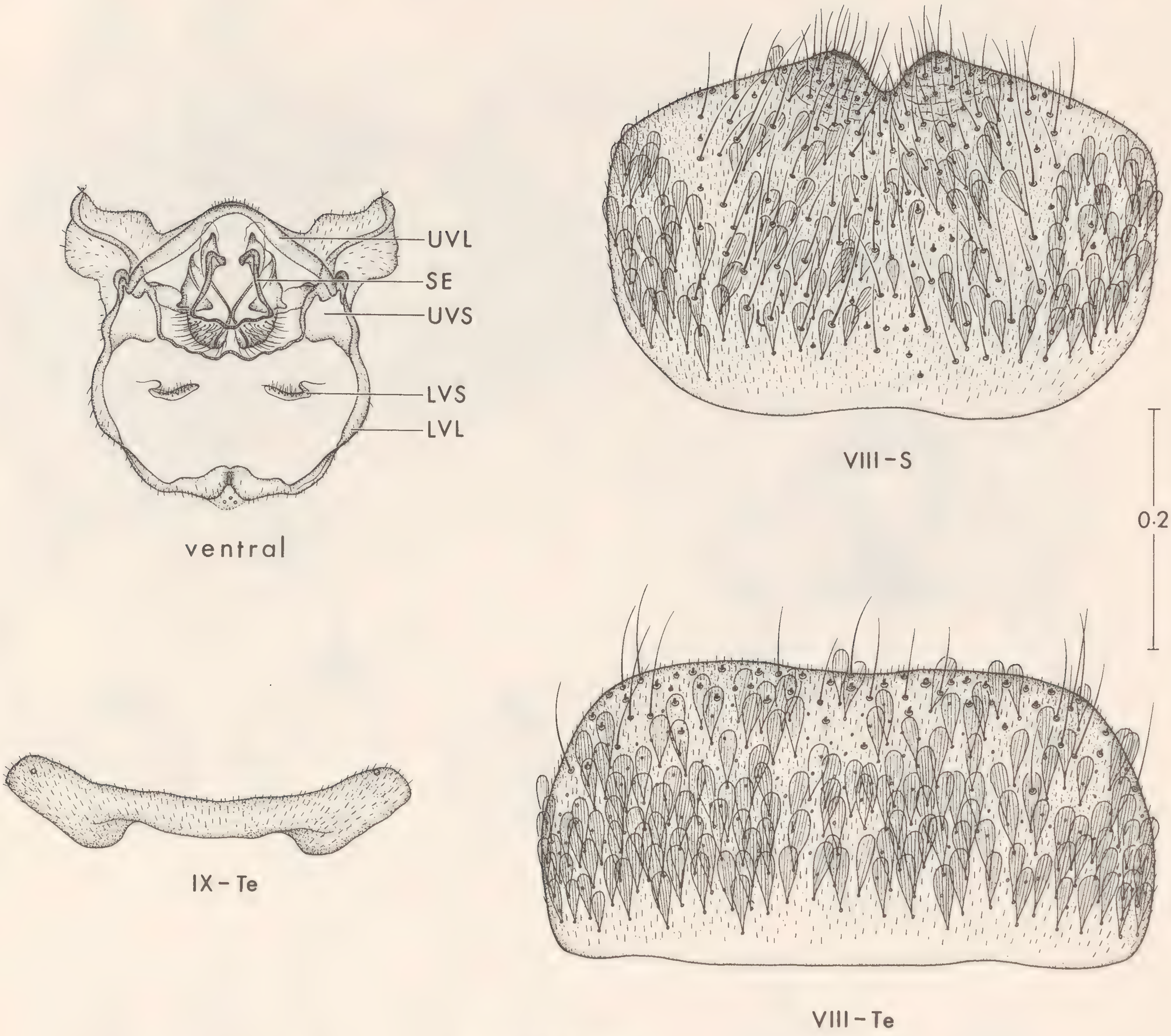
johorensis

Fig.12



lankaensis

Fig.13



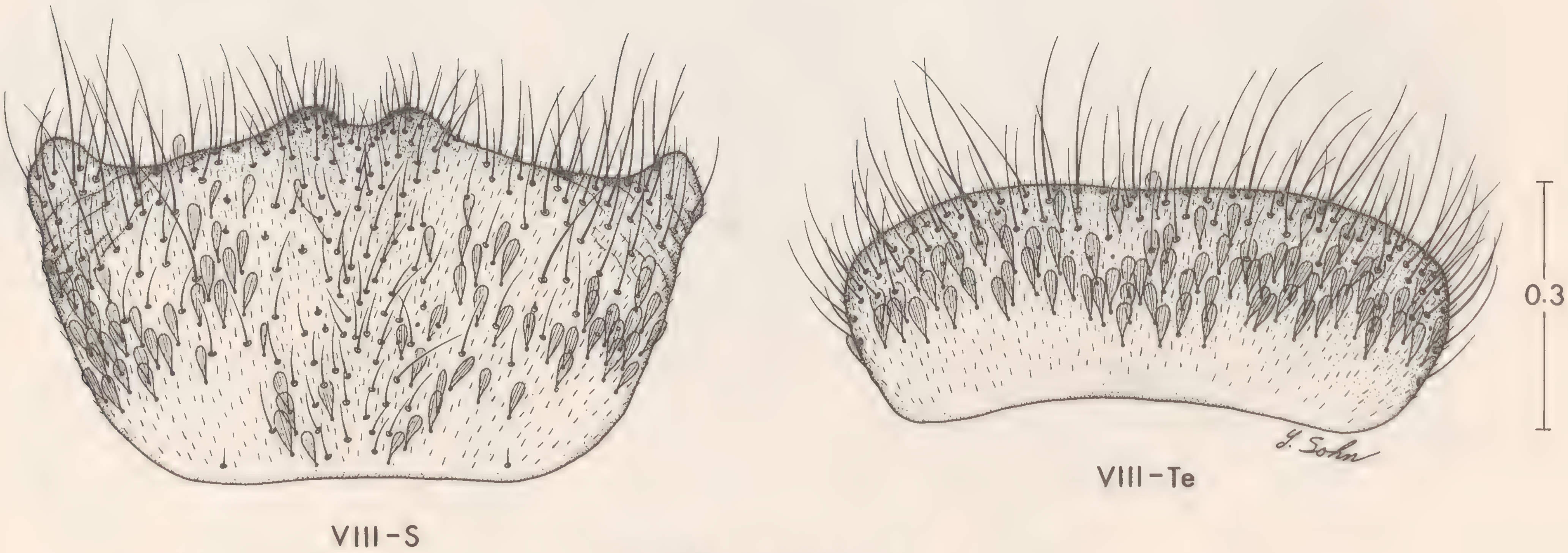
ventral

IX - Te

VIII - S

VIII - Te

notabilis

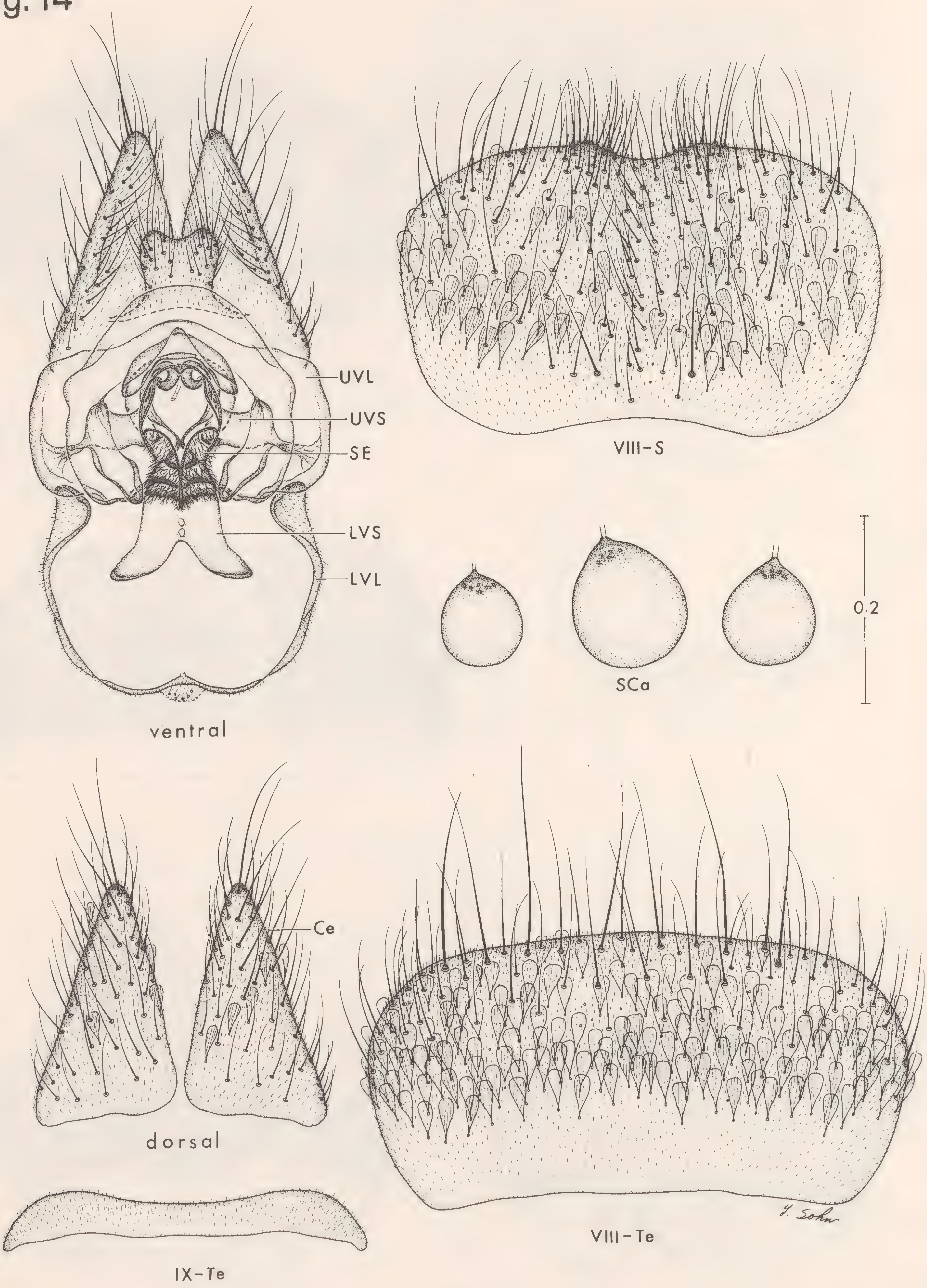


VIII - S

VIII - Te

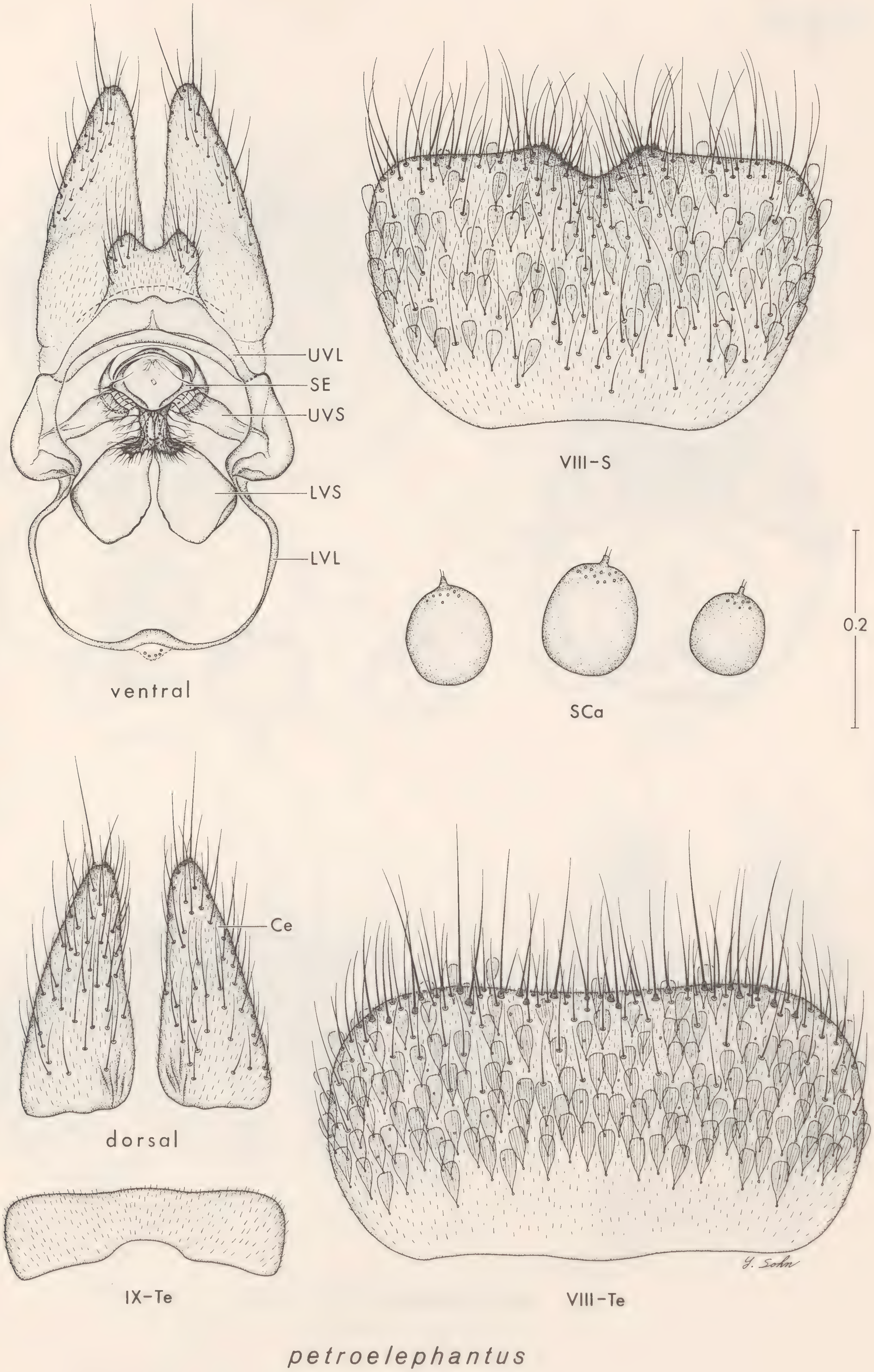
latipennis

Fig. 14



leicesteri

Fig. 15



ventral

VIII-S

SCa

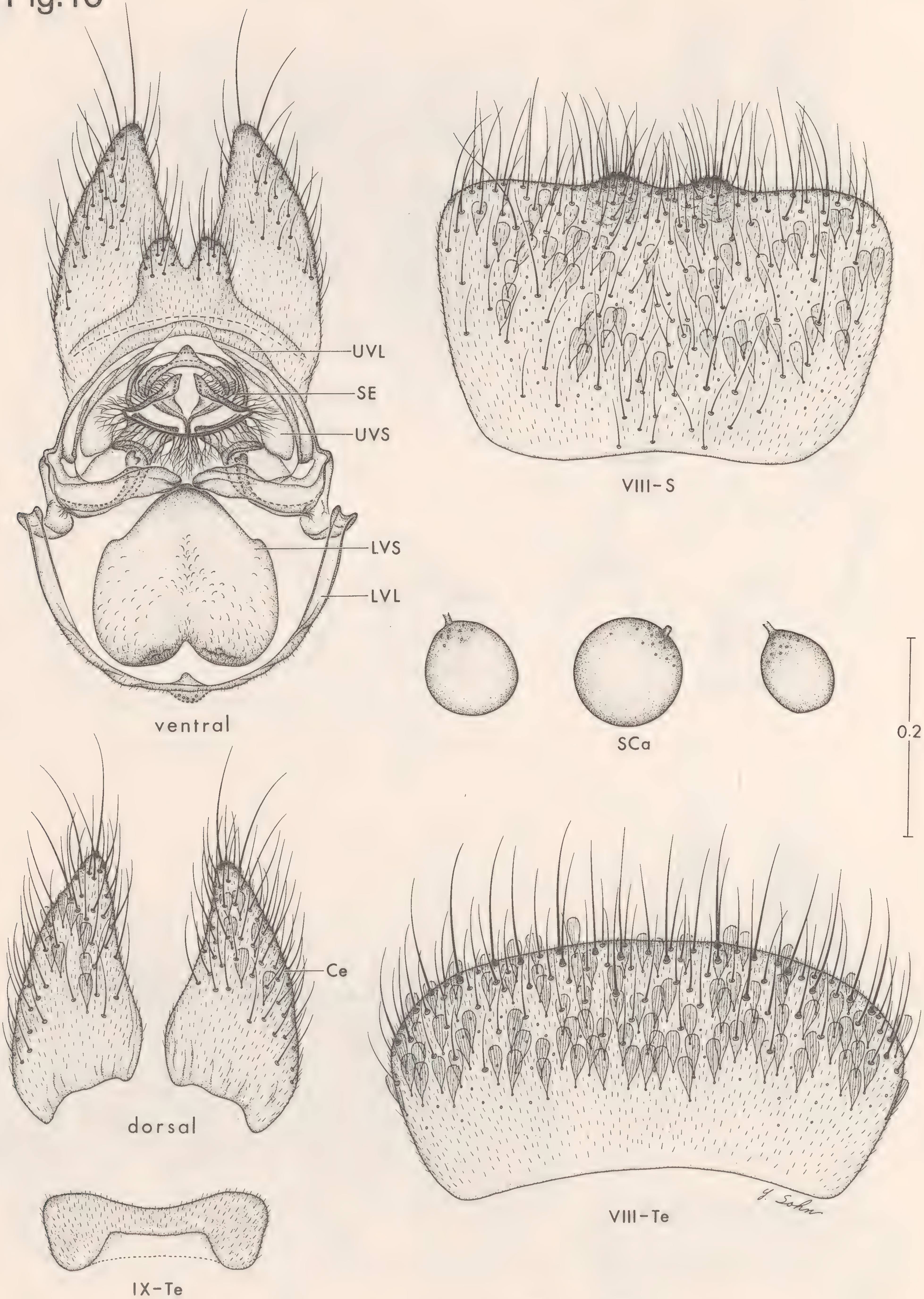
dorsal

IX-Te

VIII-Te

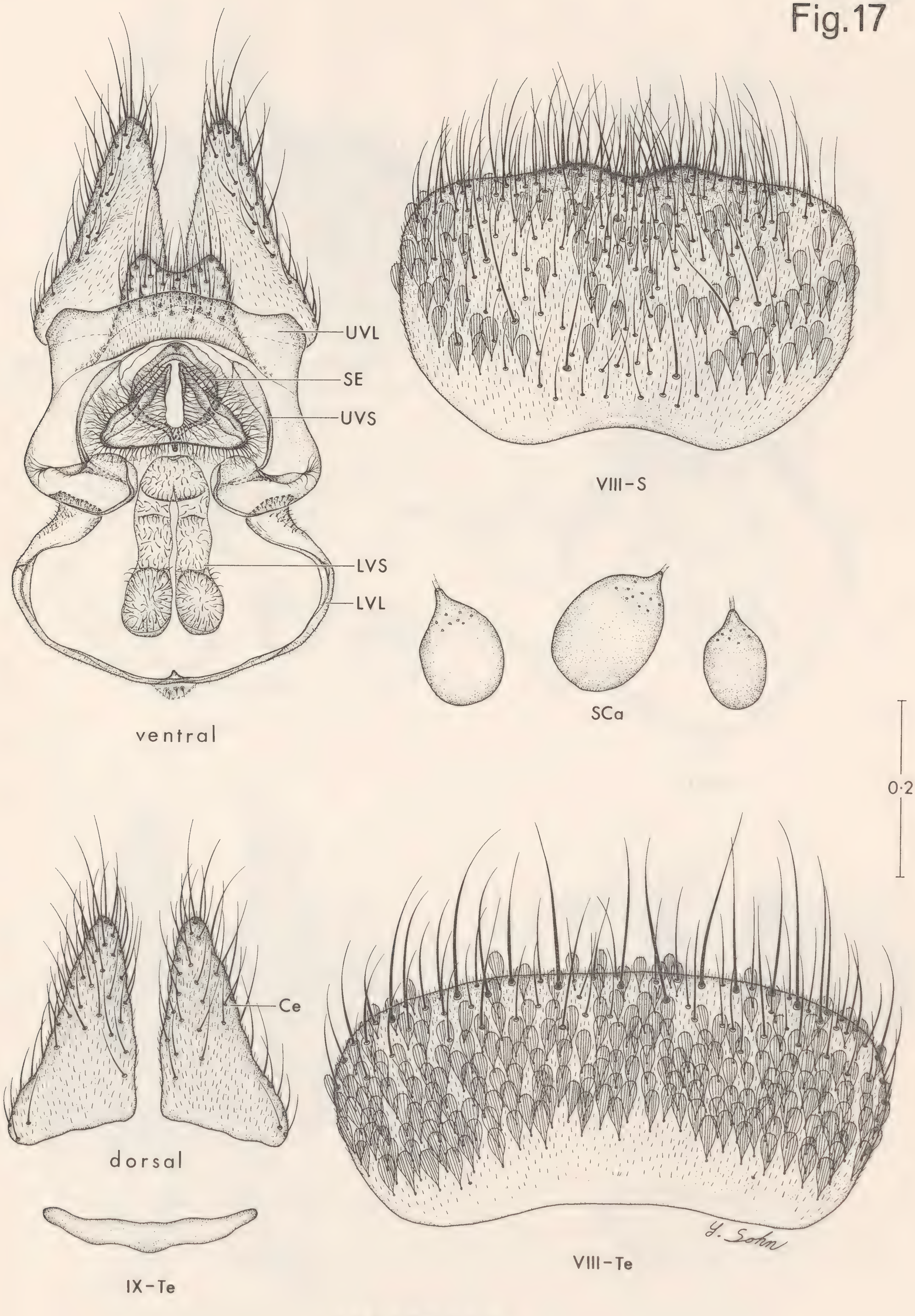
petroelephantus

Fig.16



pseudomediofasciatus

Fig.17



ventral

VIII-S

SCa

dorsal

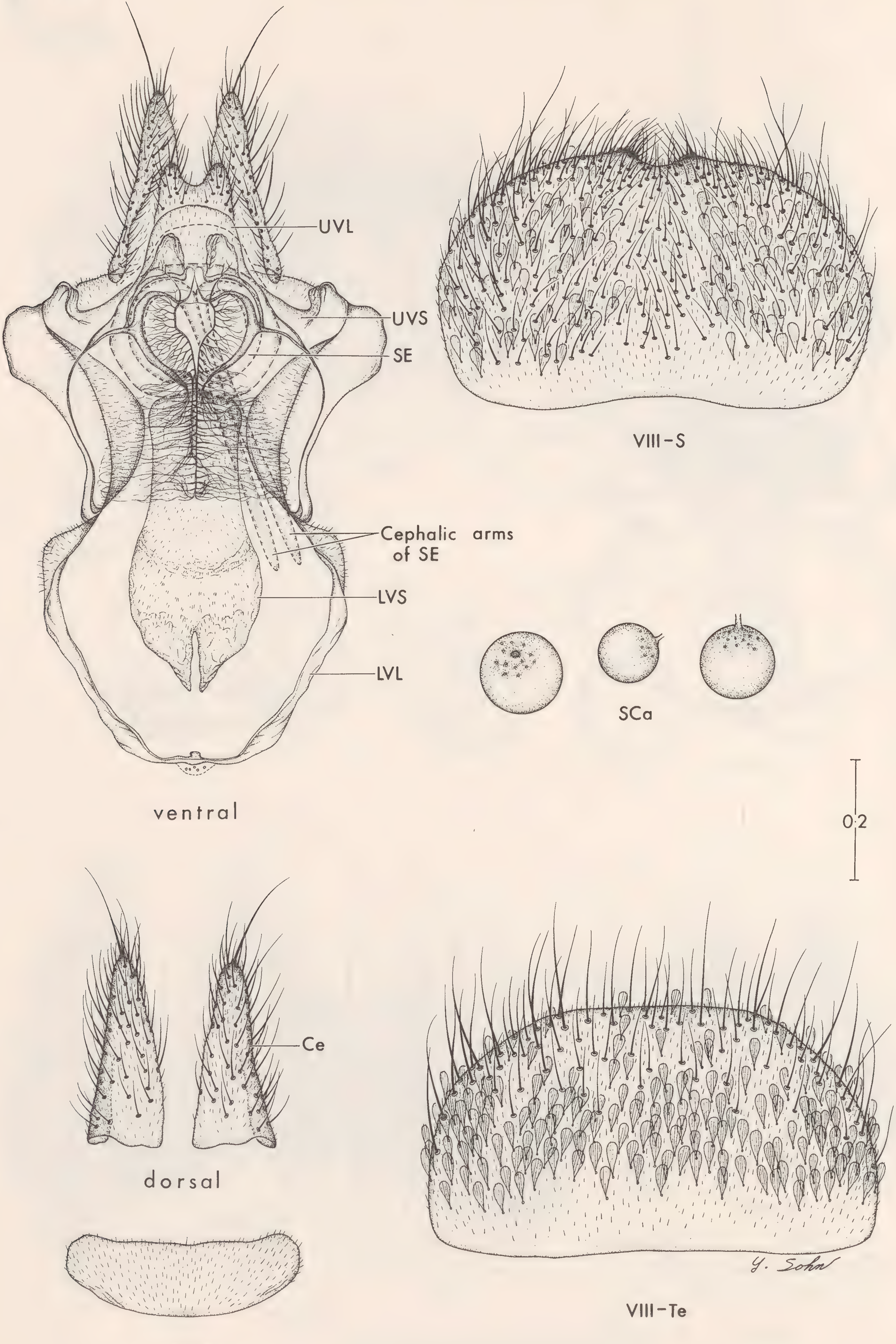
IX-Te

VIII-Te

Y. Sohn

sabahensis

Fig.18



ventral

VIII-S

SCa

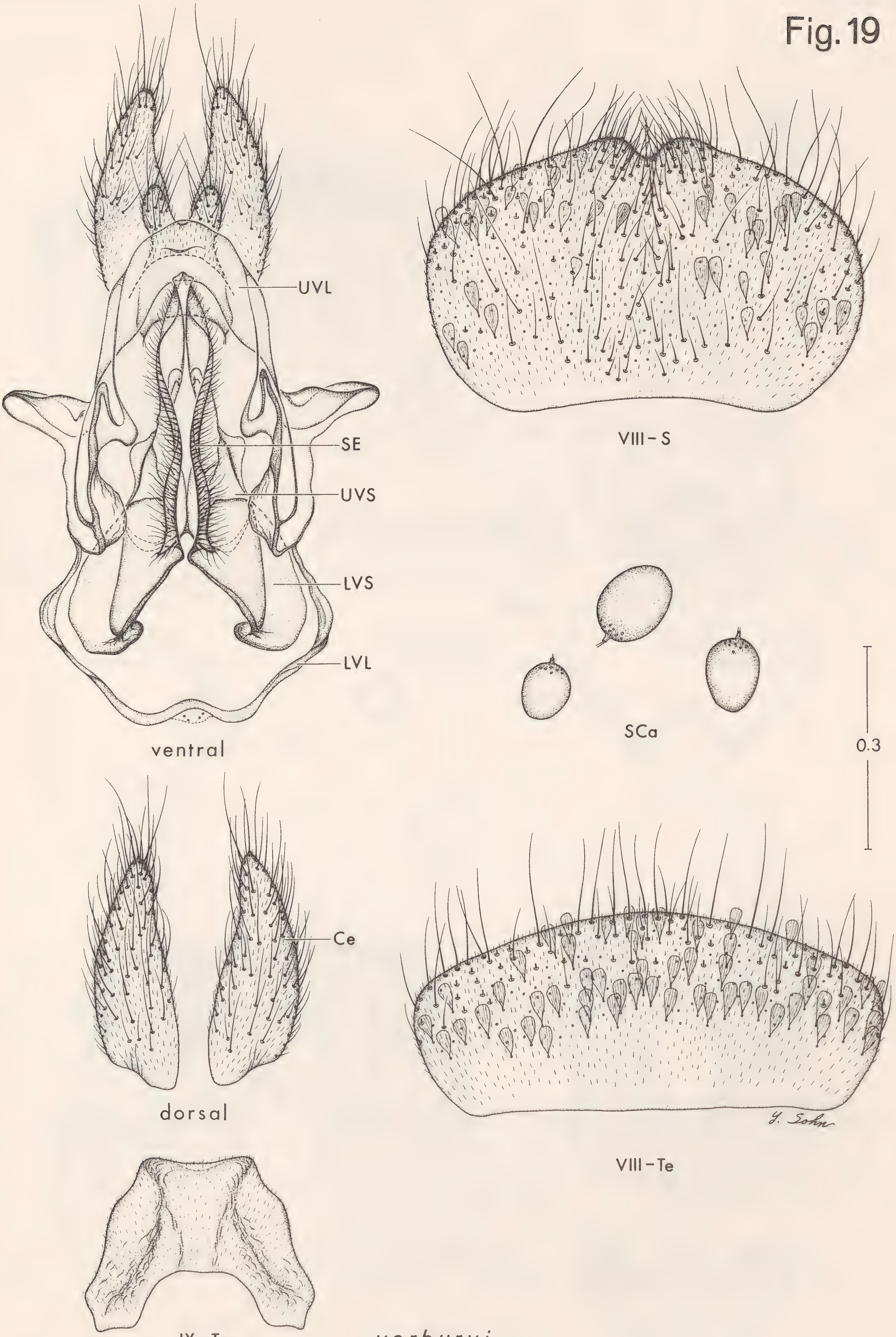
dorsal

IX-Te

VIII-Te

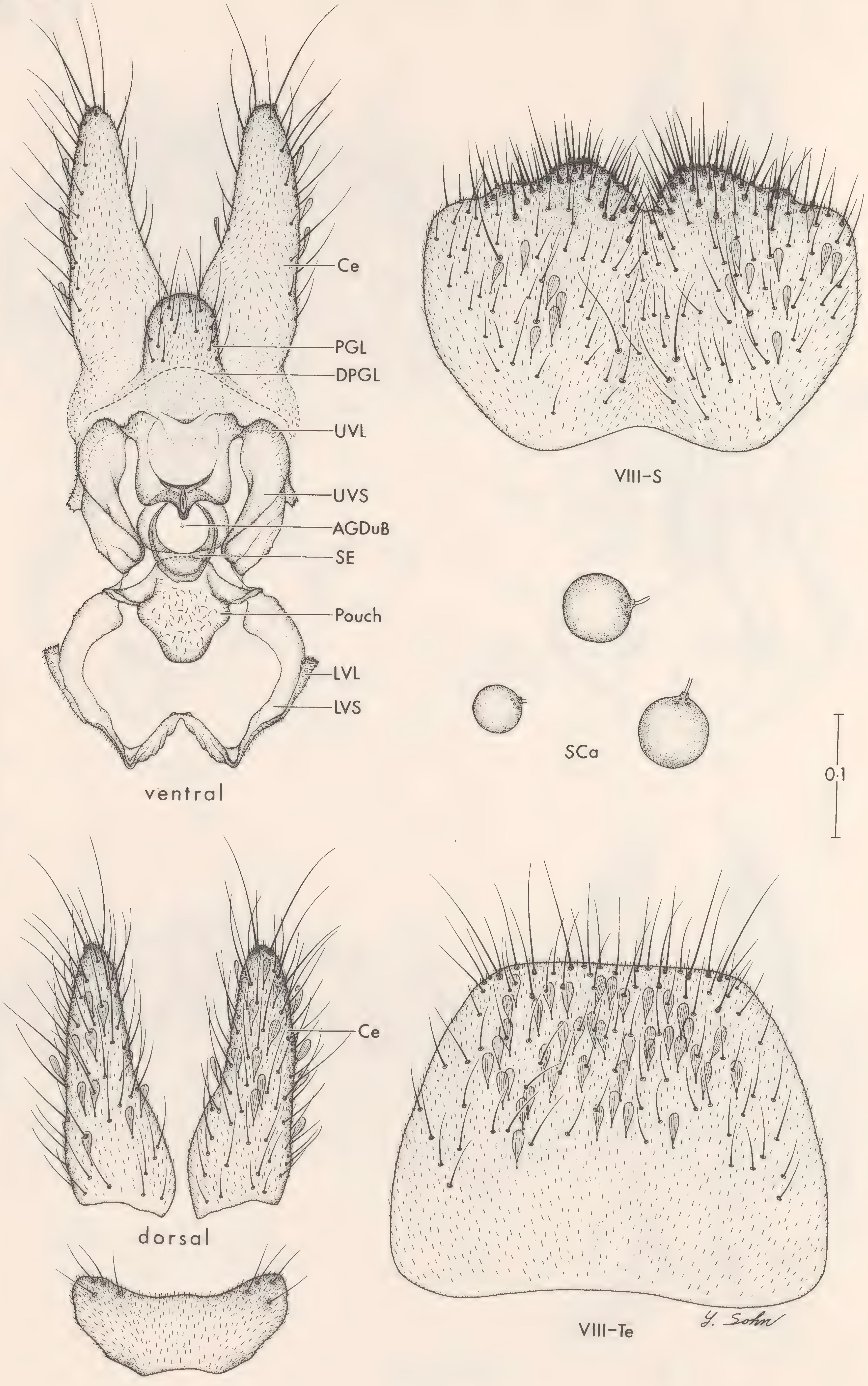
virilis

Fig. 19



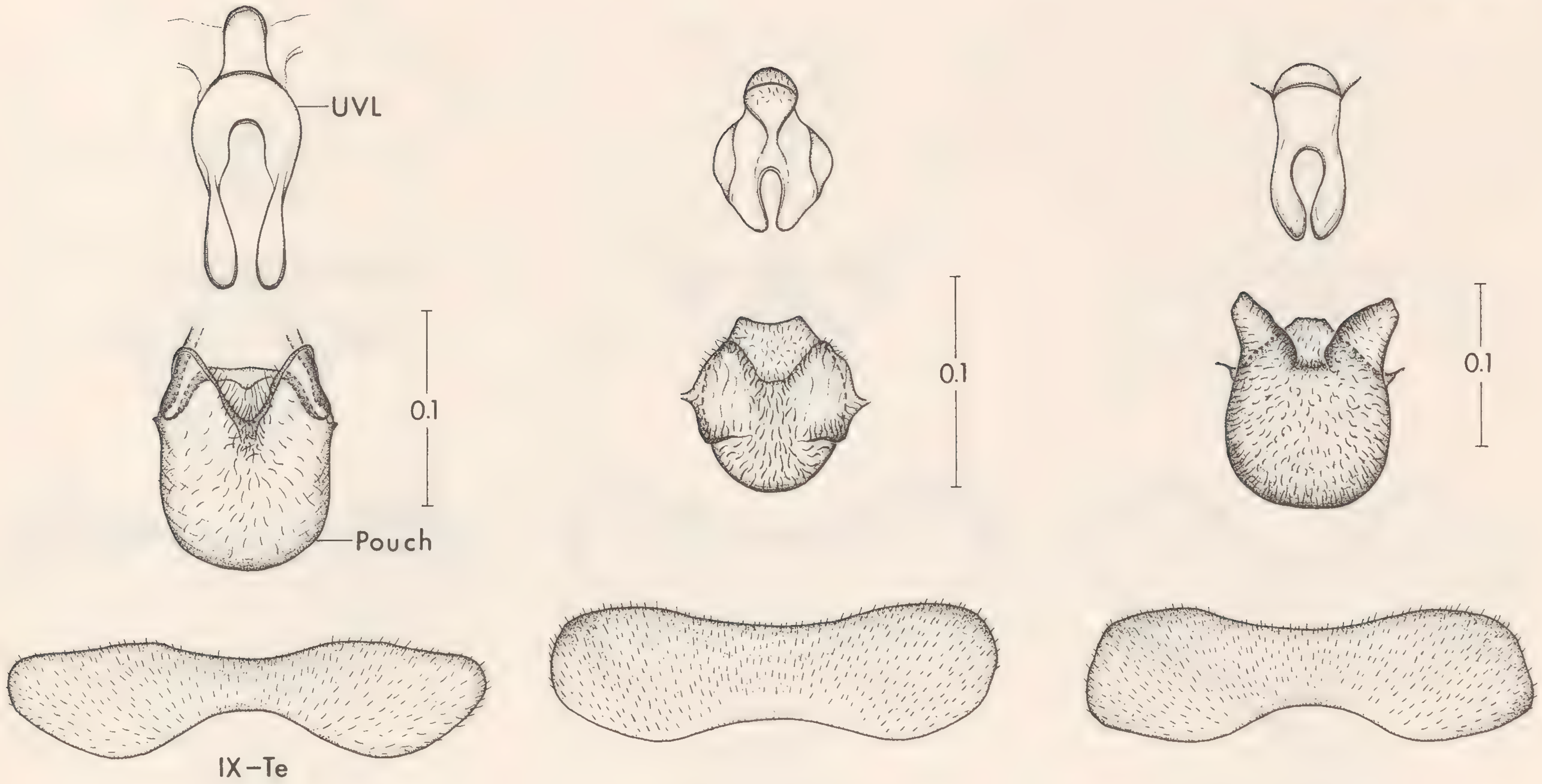
yerburyi

Fig. 20



yusafi

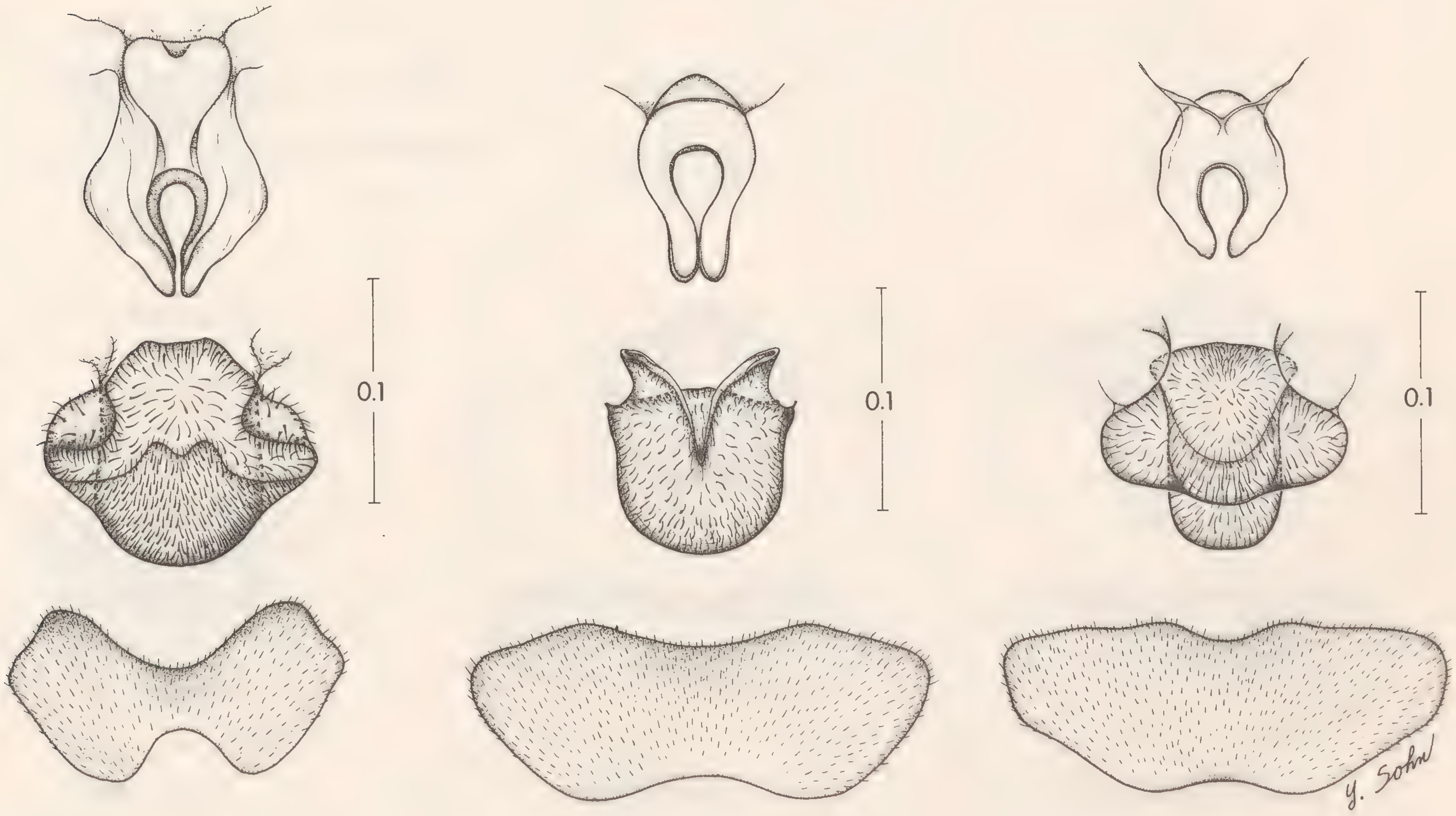
Fig. 21



fragilis
(Holotype *malaya*)

hamistylus
(Paratype)

stungus
(Holotype)

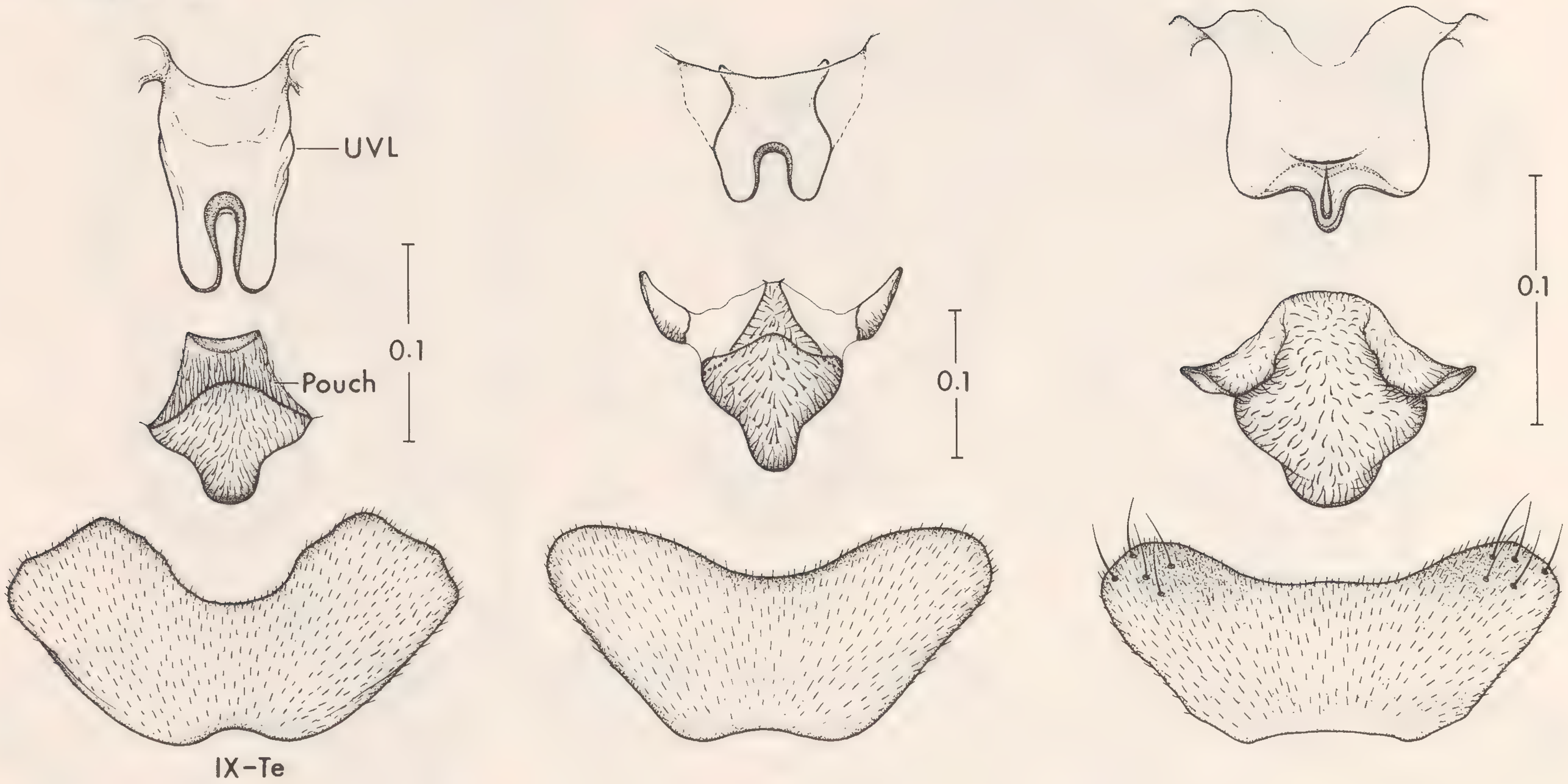


uniformis

indecorabilis
(of Klein, 1973 Cambodia)

indecorabilis
(Cotype of Leicester, 1908 Malaysia)

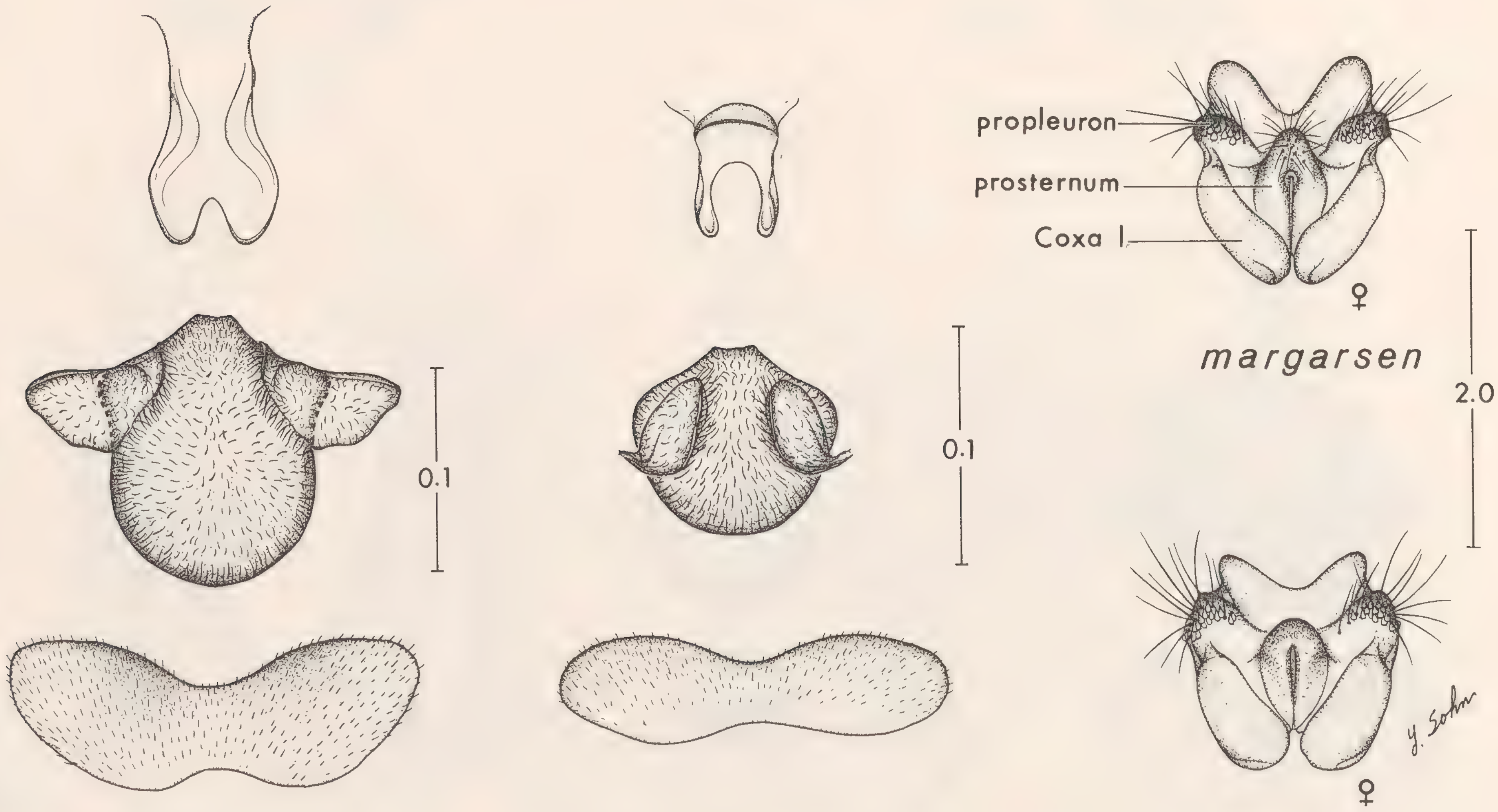
Fig. 22



abditus
(Holotype)

pahangi
(Holotype)

yusafi
(Holotype)



nobukonis
(Paratype ishigakiensis)

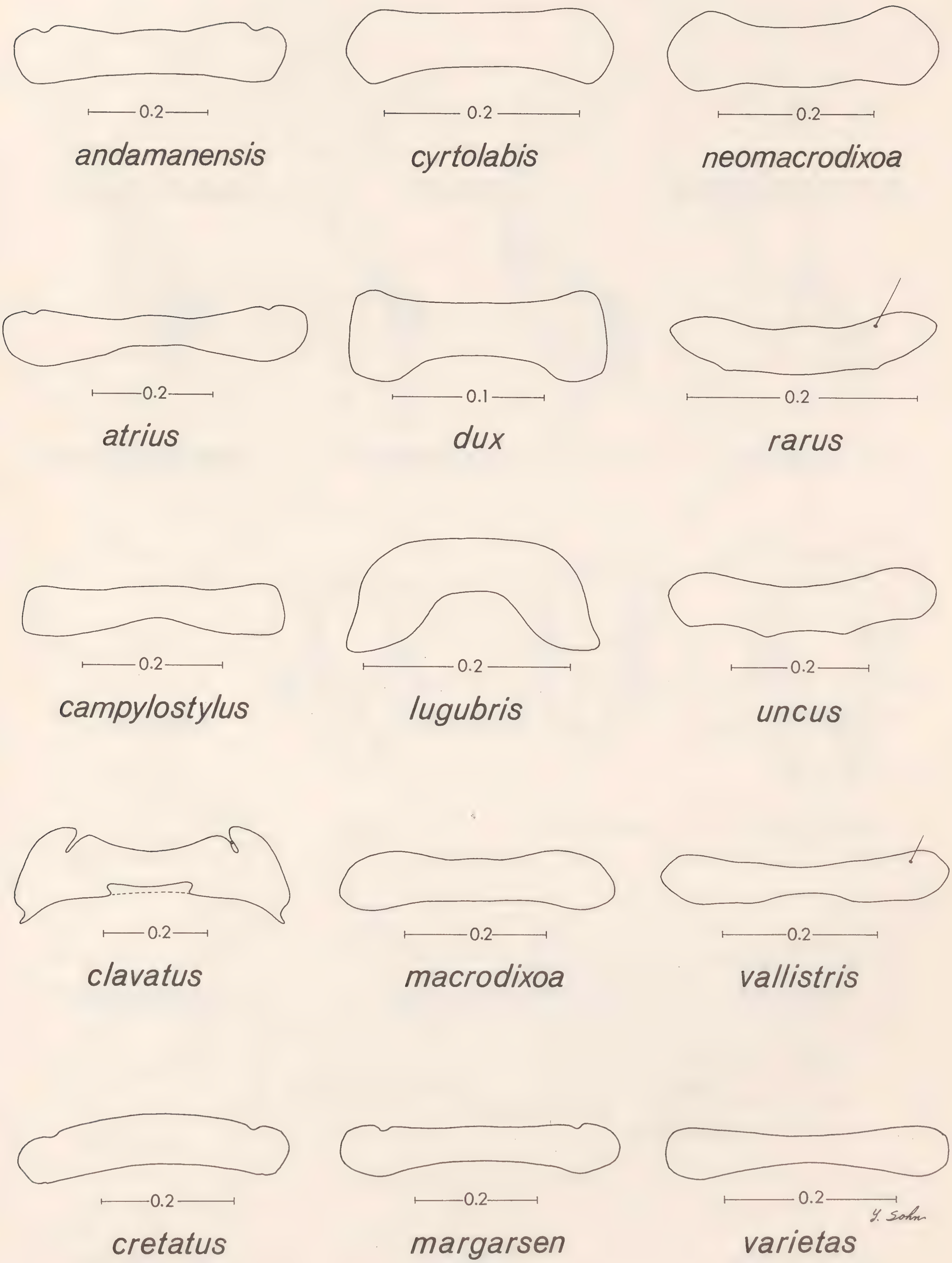
robertsi
(Paratype)

margarsen

johnsoni

Fig. 23

FEMALE TERGUM IX
SECTION A, SERIES II & III



andamanensis *cyrtolabis* *neomacrodixoa*

atrius *dux* *rarus*

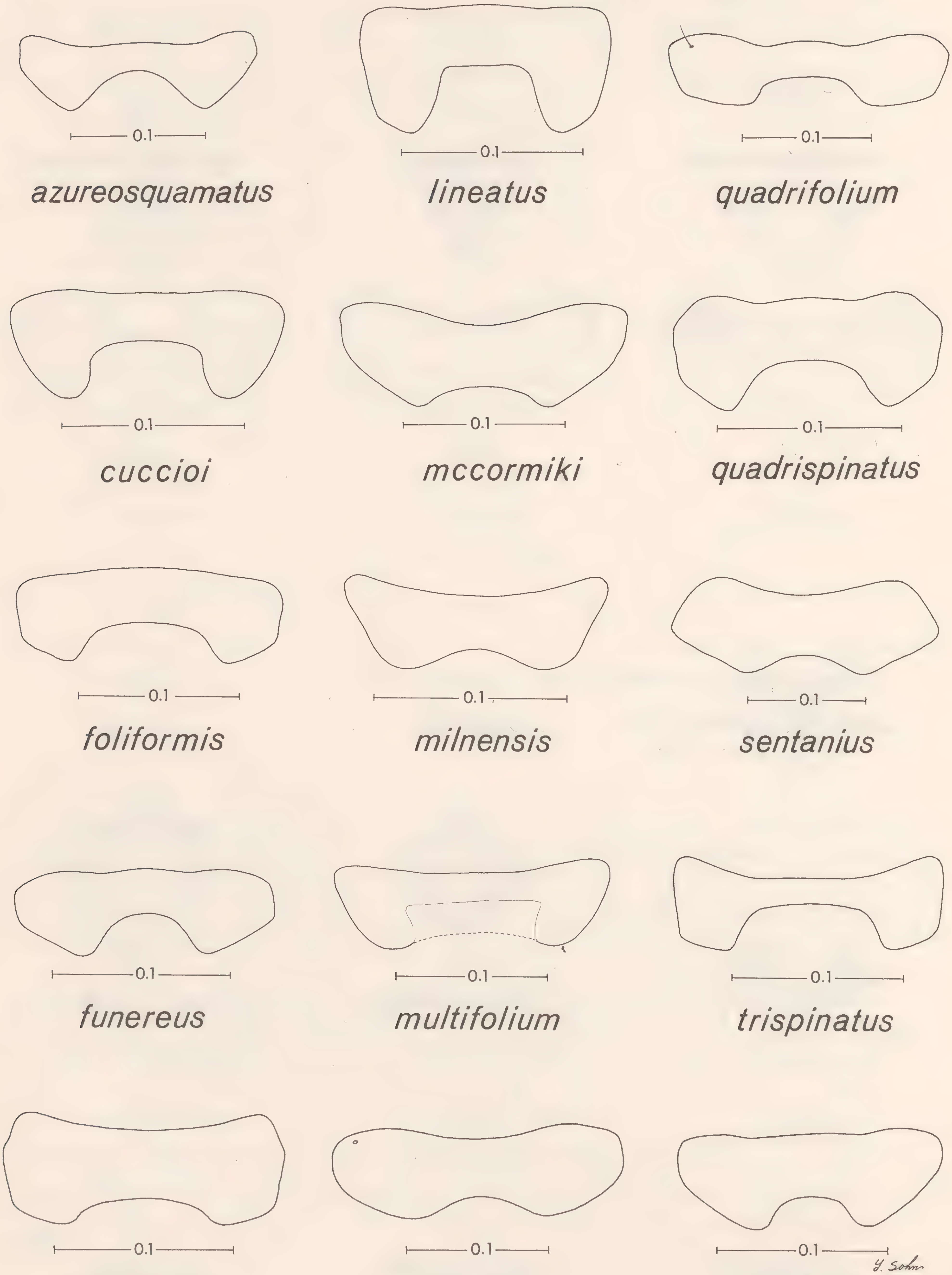
campylostylus *lugubris* *uncus*

clavatus *macrodixoa* *vallistris*

cretatus *margarsen* *varietas*

Fig. 24

FEMALE TERGUM IX
SECTION A, SERIES I



azureosquamatus *lineatus* *quadrifolium*

cuccioi *mccormiki* *quadrispinatus*

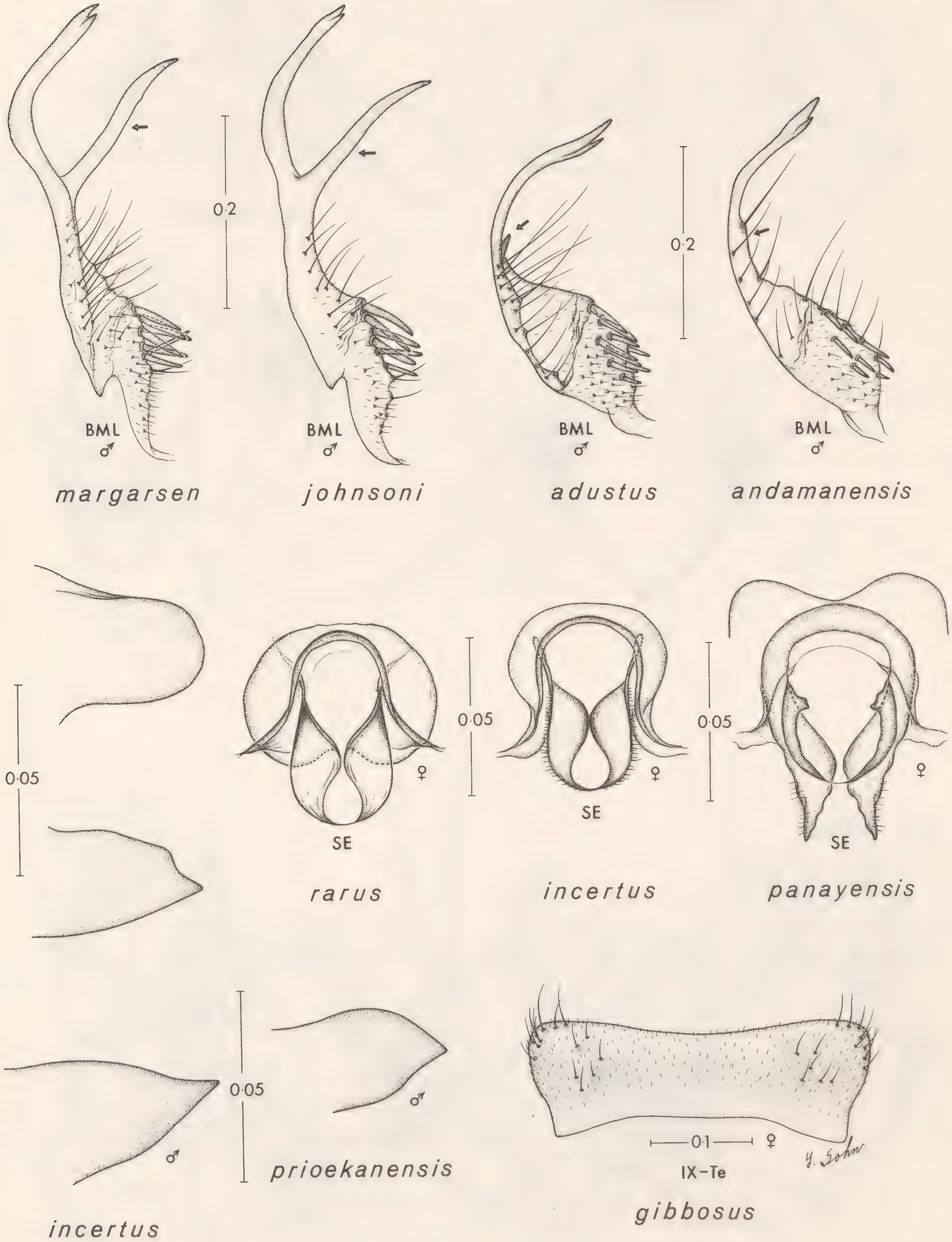
foliformis *milnensis* *sentanius*

funereus *multifolium* *trispinatus*

killertonis *pipkini* *variabilis*

Y. Sohn

Fig. 25

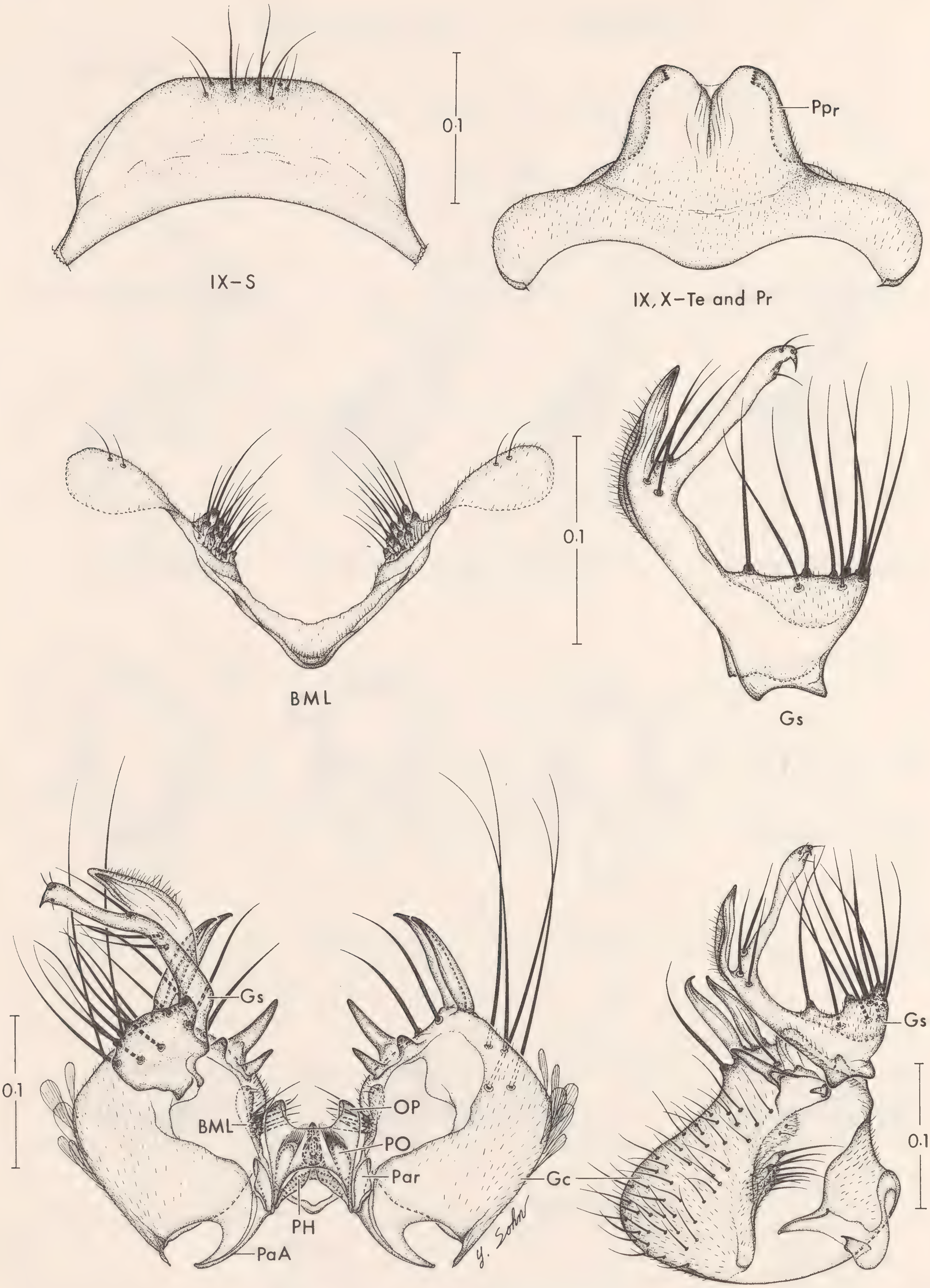


margarsen *johnsoni* *adustus* *andamanensis*

rarus *incertus* *panayensis*

incertus *prioekanensis* *gibbosus*

Fig. 26



IX–S

IX, X–Te and Pr

BML

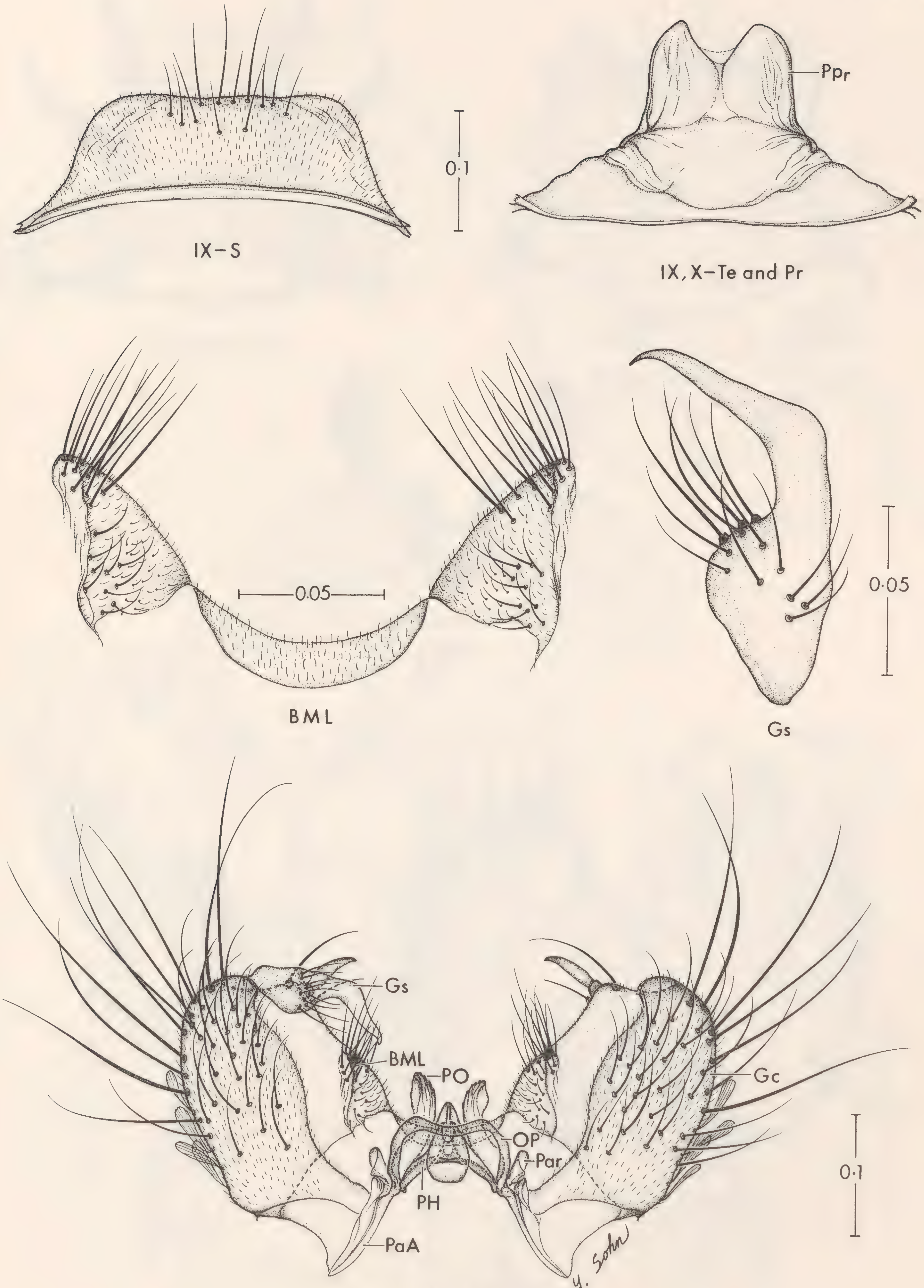
Gs

dorsal

mesal

butleri

Fig. 27



IX–S

IX, X–Te and Pr

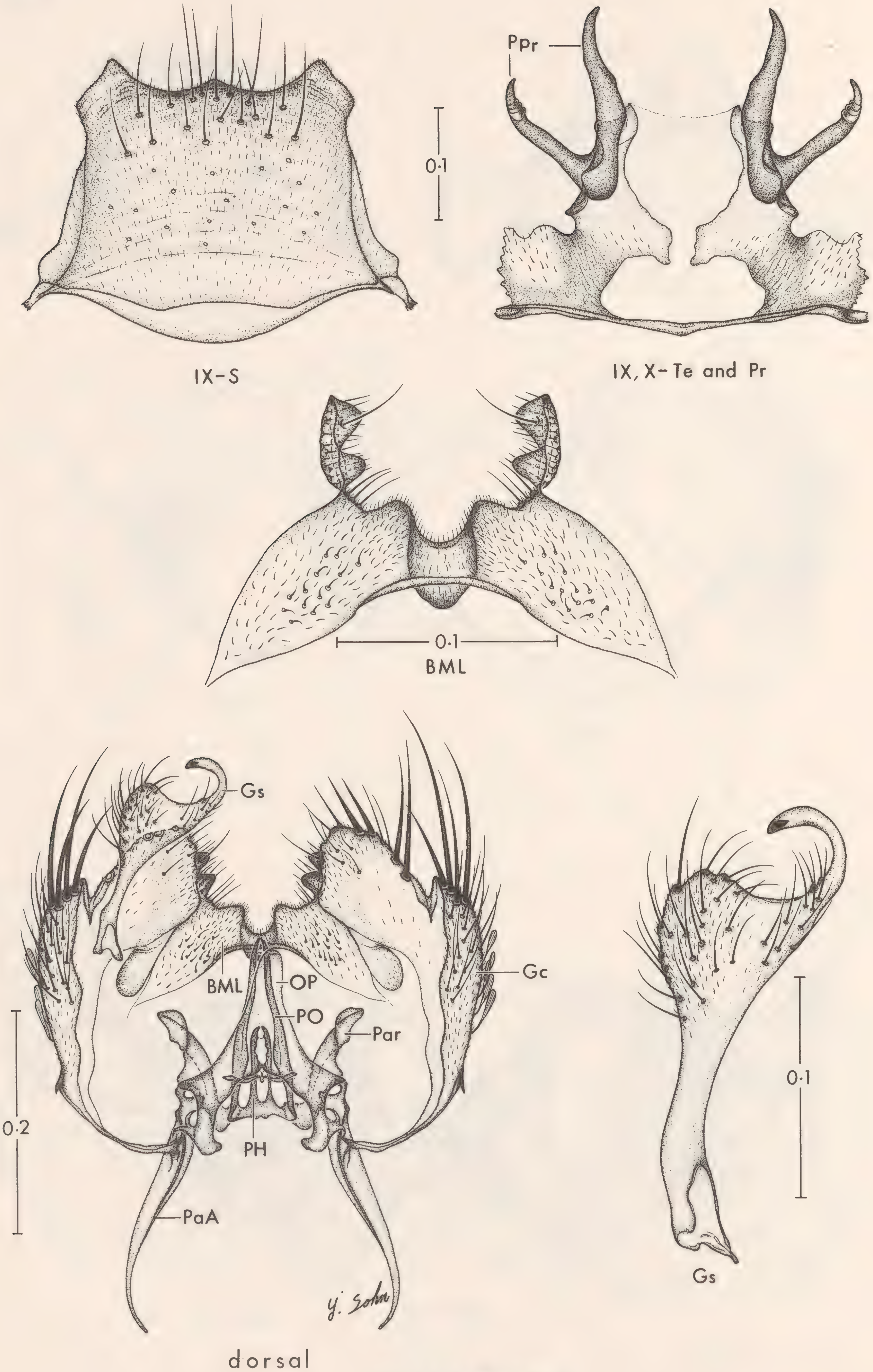
BML

Gs

dorsal

carmenti

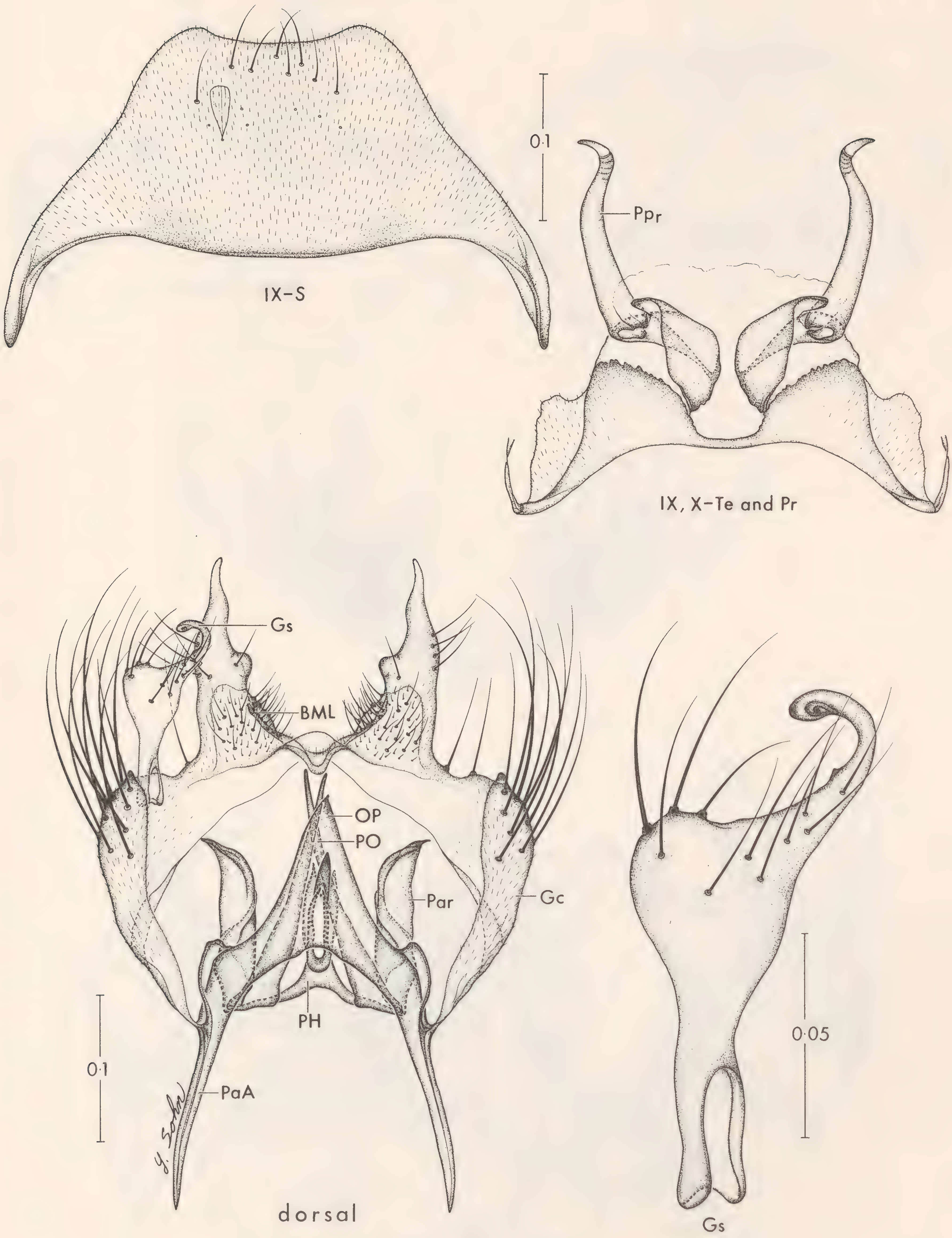
Fig. 28



dorsal

consonensis

Fig. 29



IX–S

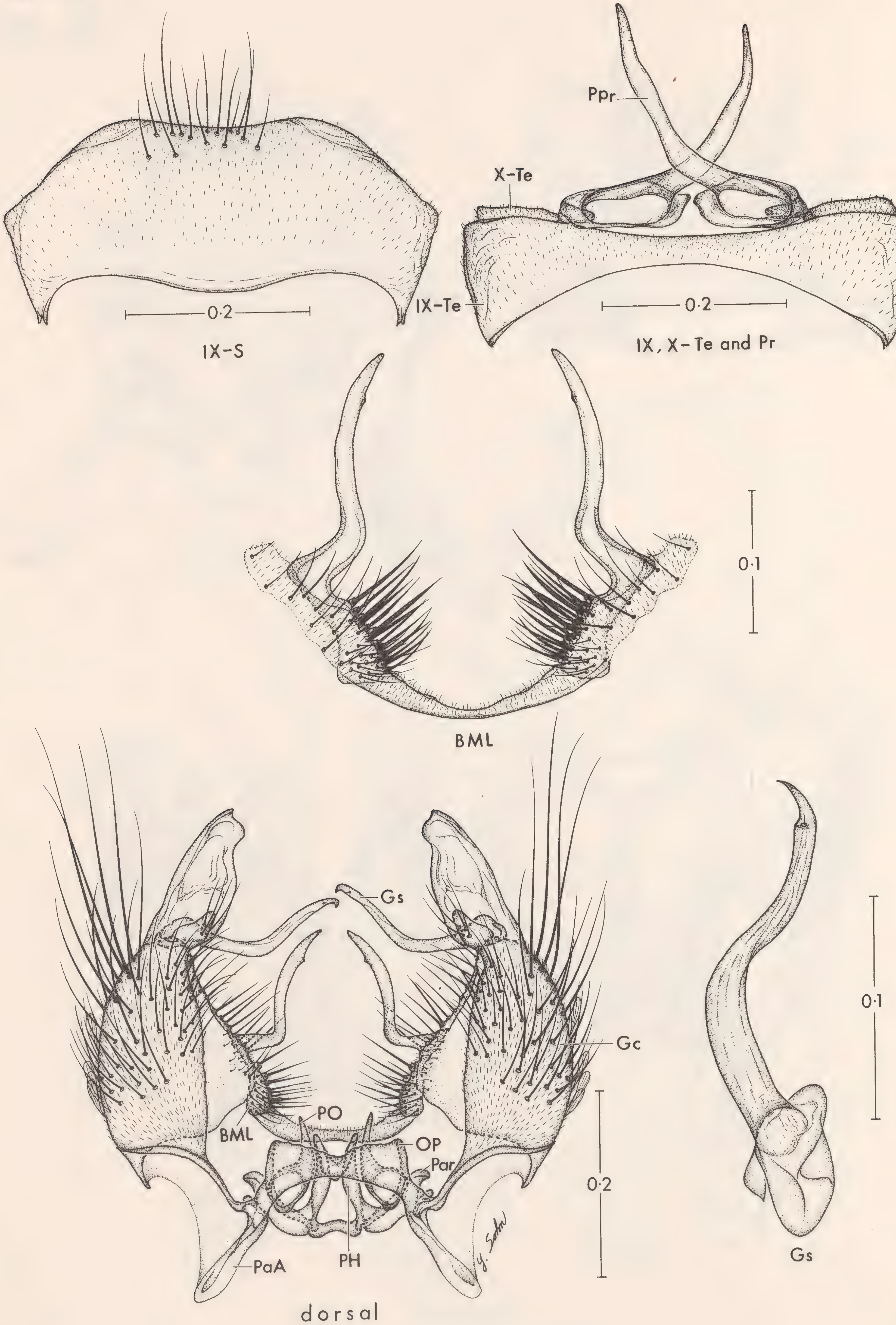
IX, X–Te and Pr

dorsal

Gs

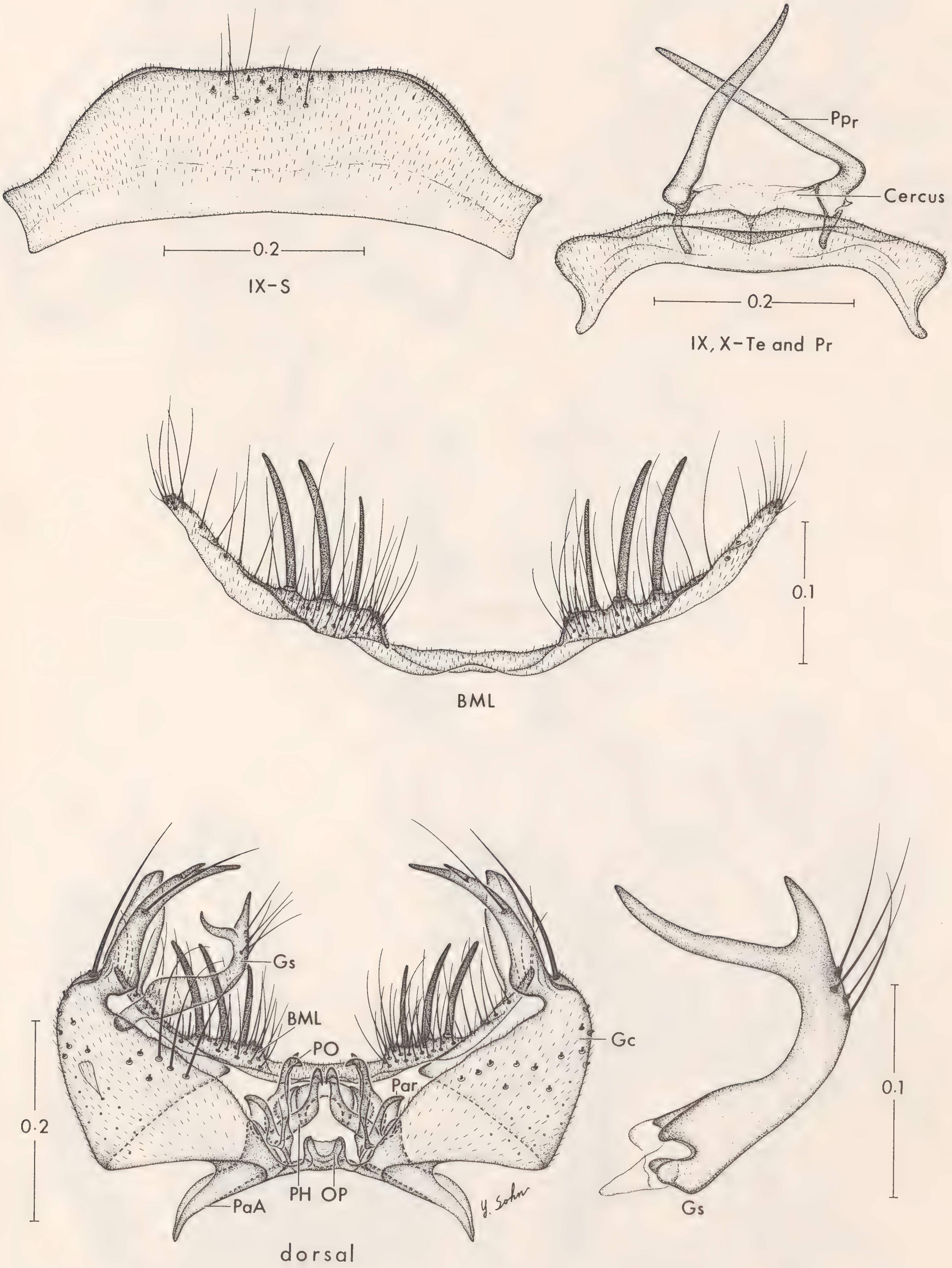
fragilis

Fig. 30



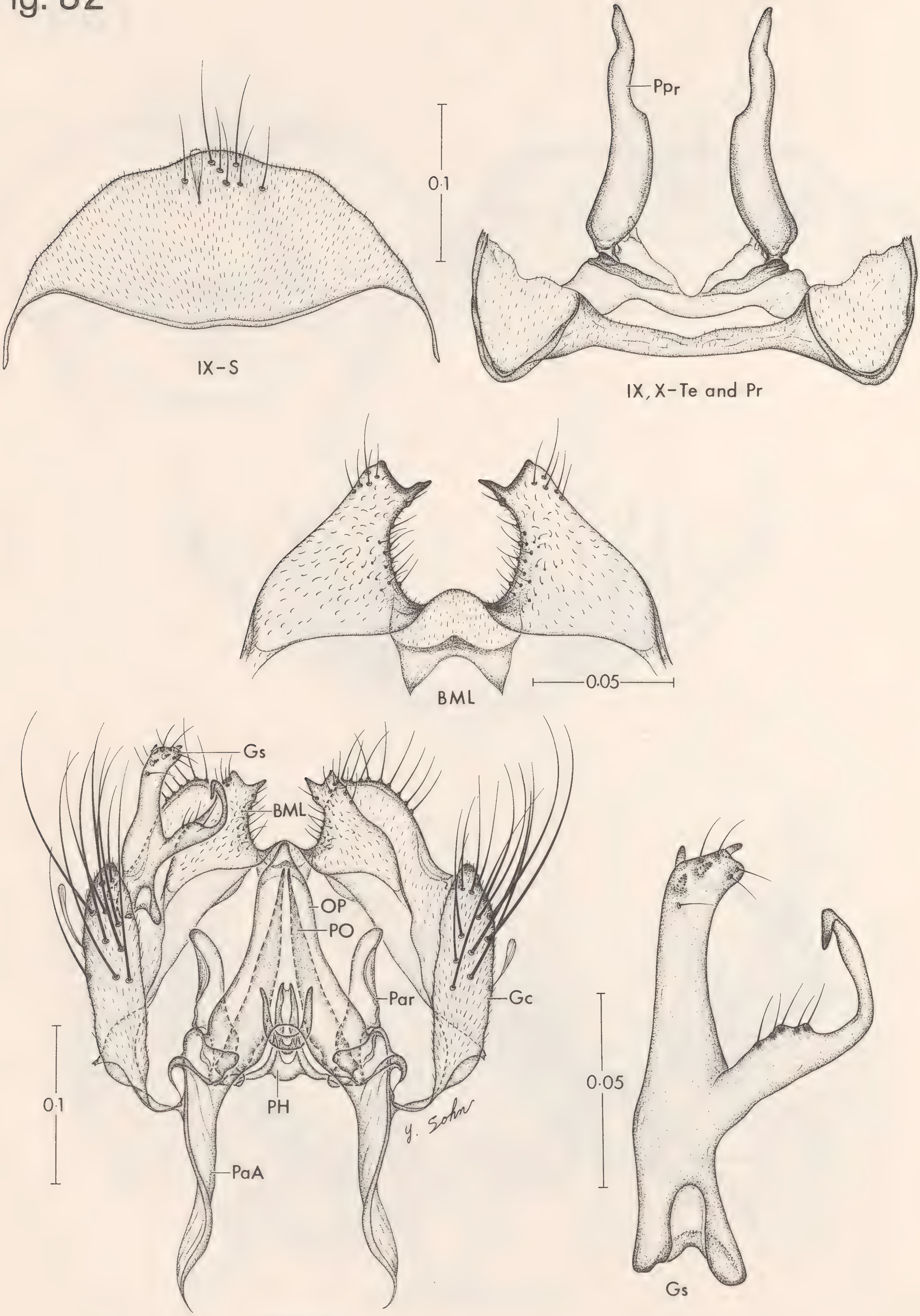
indicus

Fig. 31



pseudovarietas

Fig. 32



IX–S

IX, X–Te and Pr

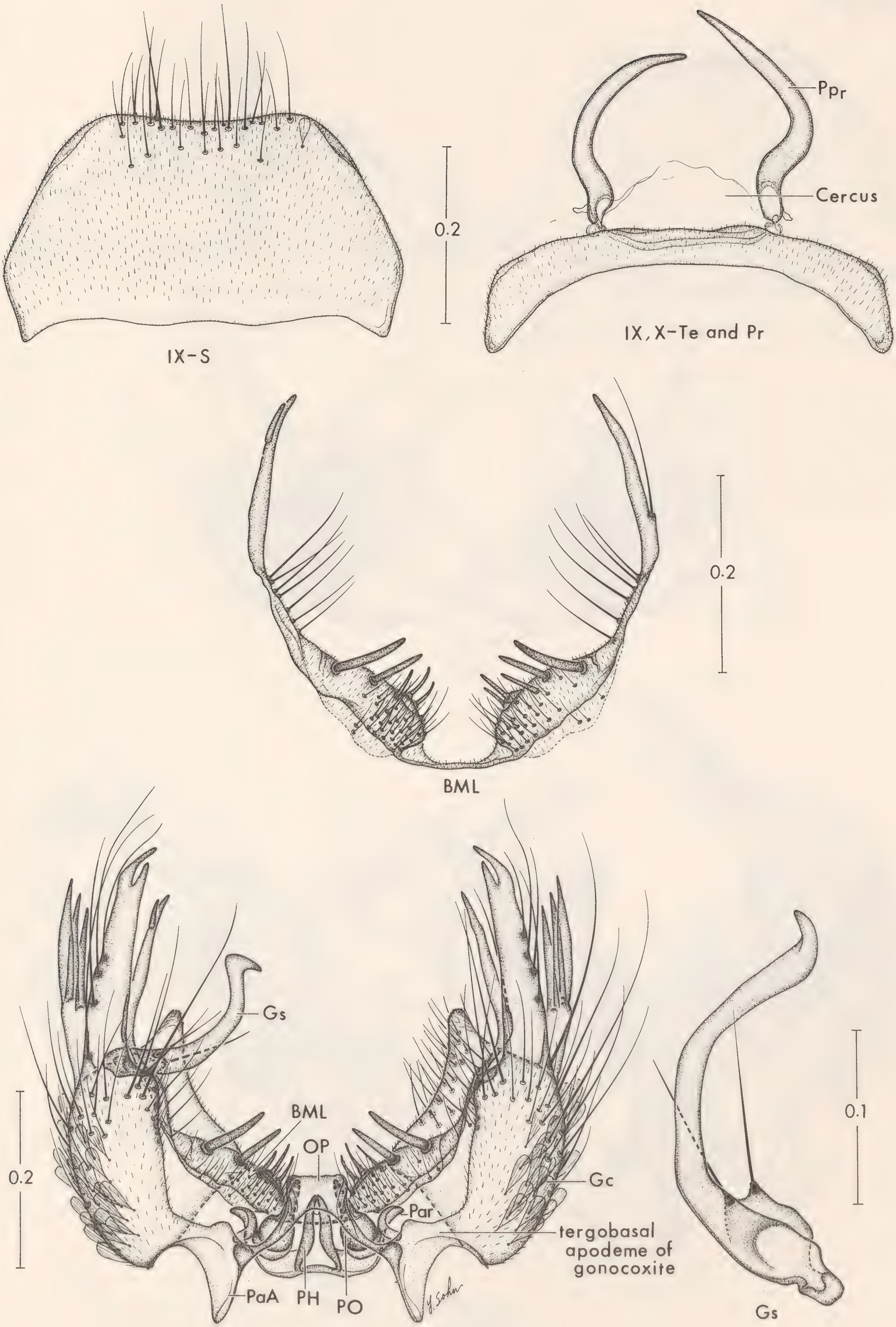
BML

dorsal

Gs

ramalingami

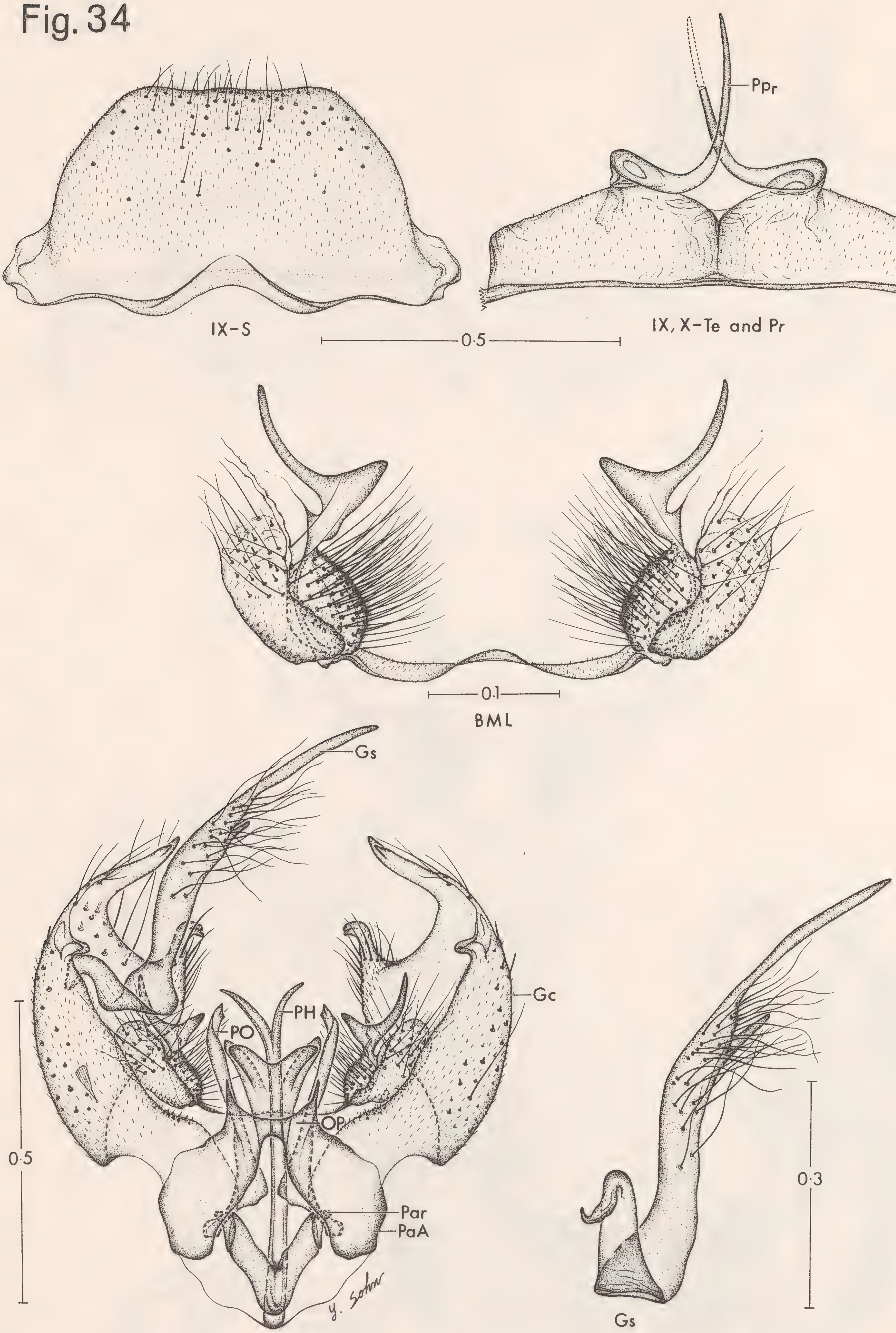
Fig. 33



dorsal

sohni

Fig. 34



IX-S

IX, X-Te and Pr

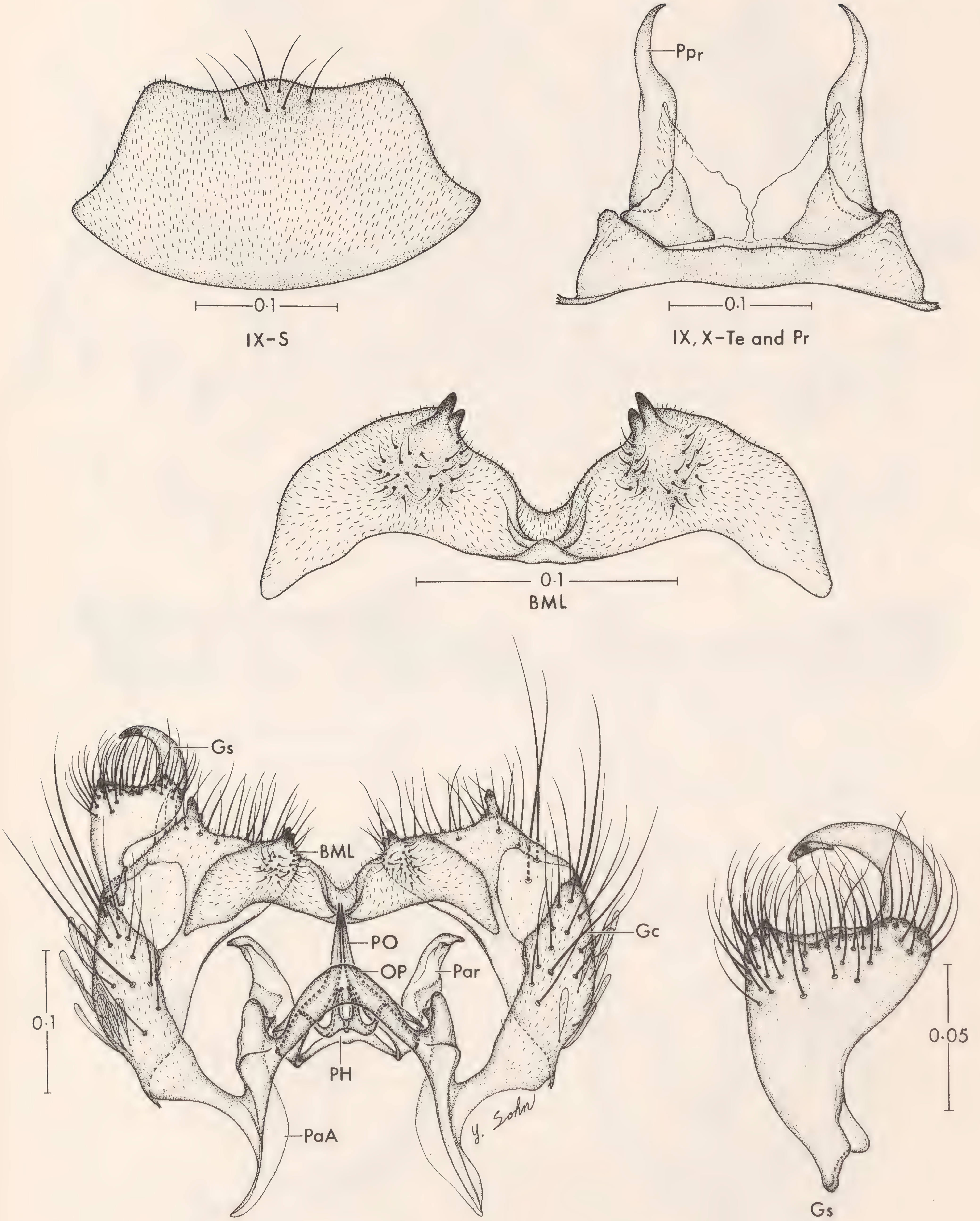
BML

dorsal

Gs

virilis

Fig. 35


IX-S

IX, X-Te and Pr

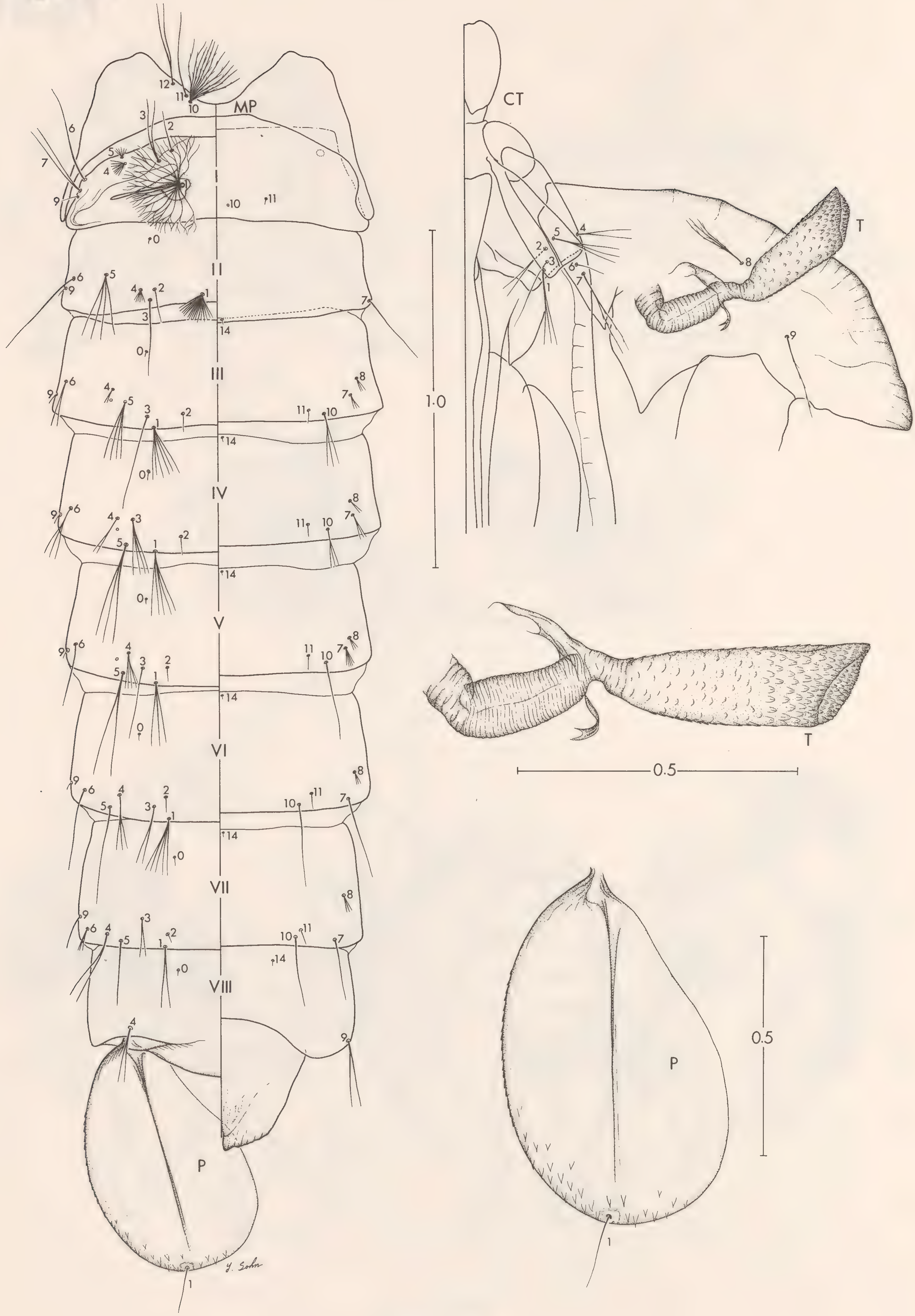
BML

dorsal

Gs

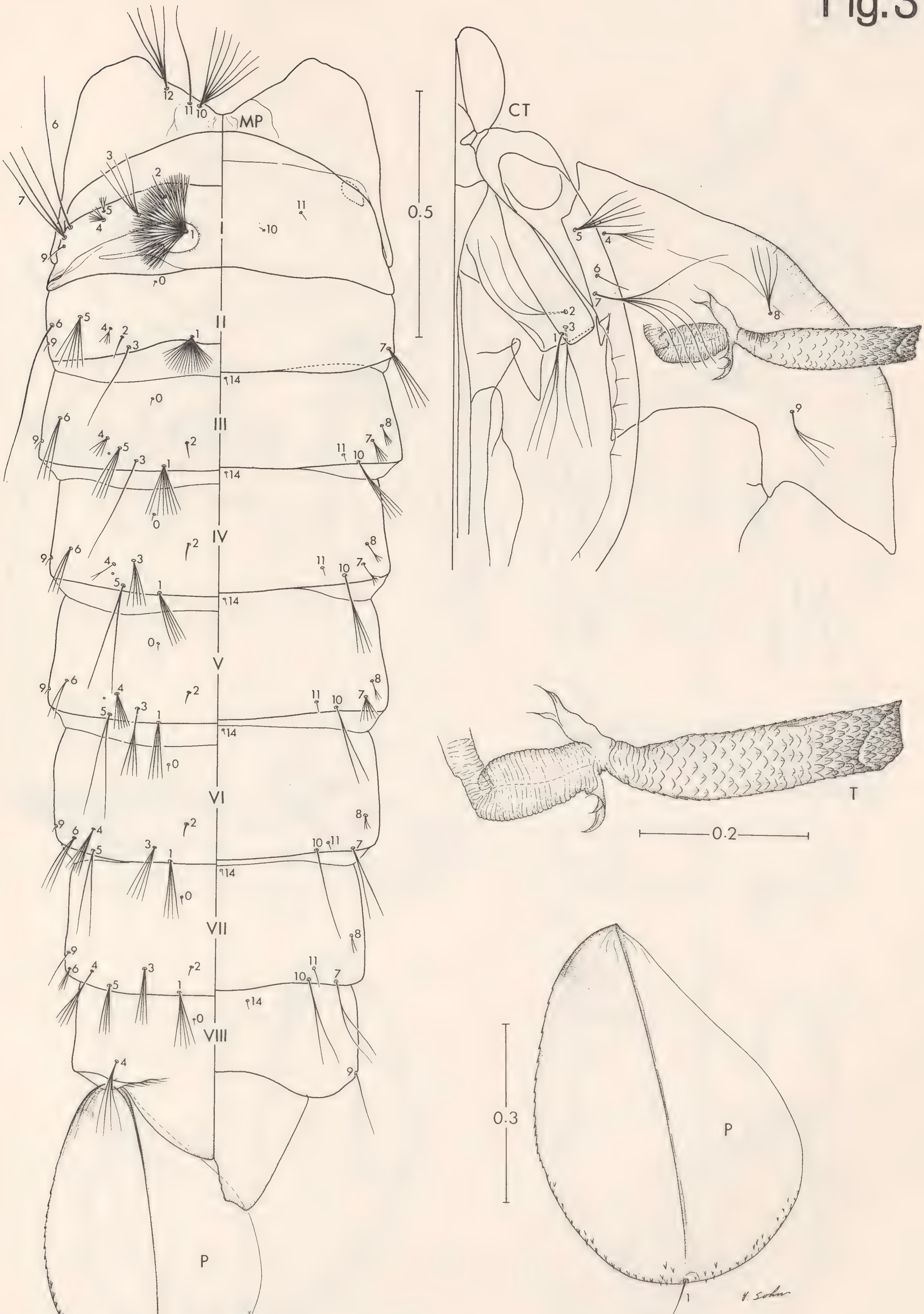
yusafi

Fig. 36



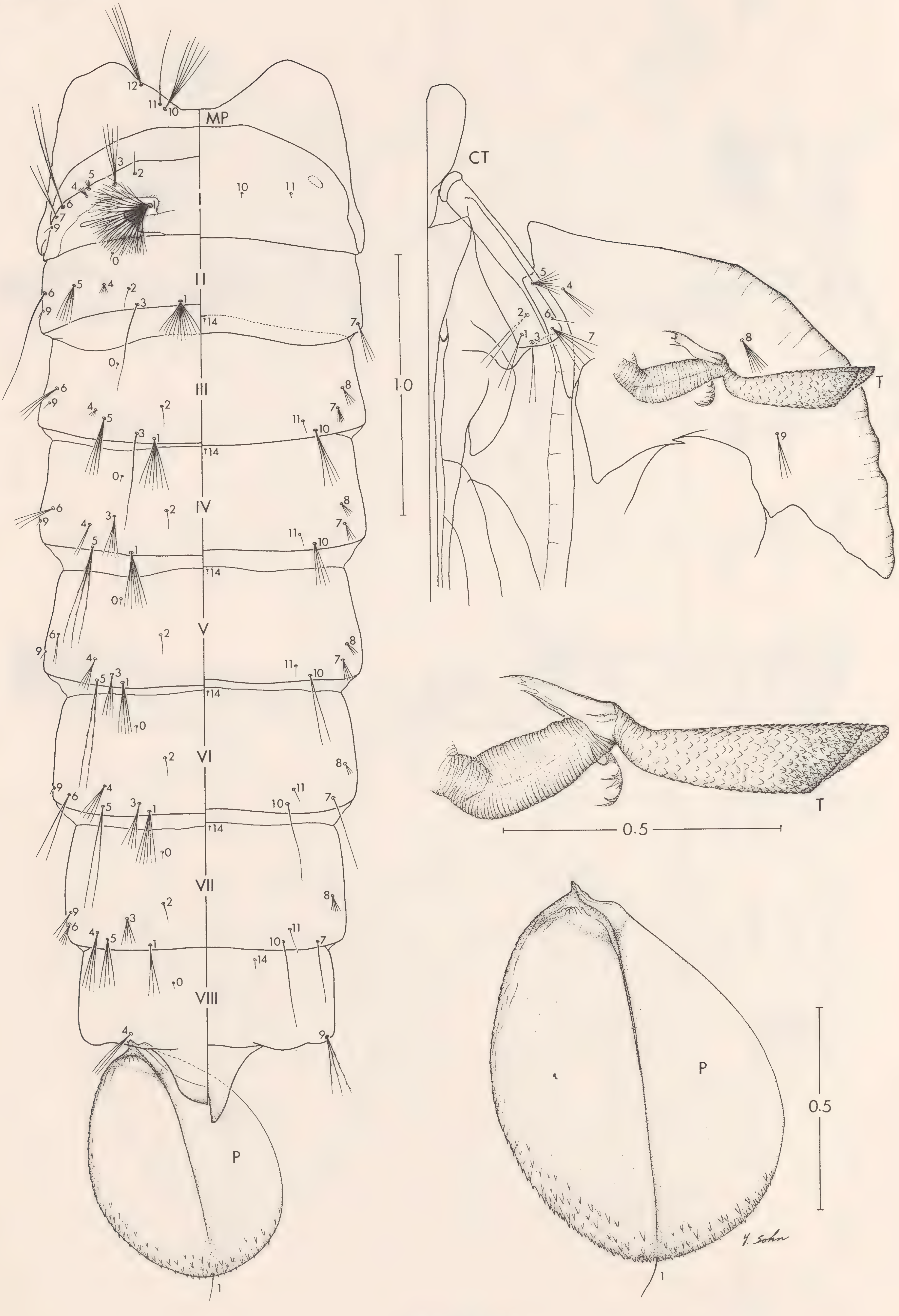
adustus

Fig.37



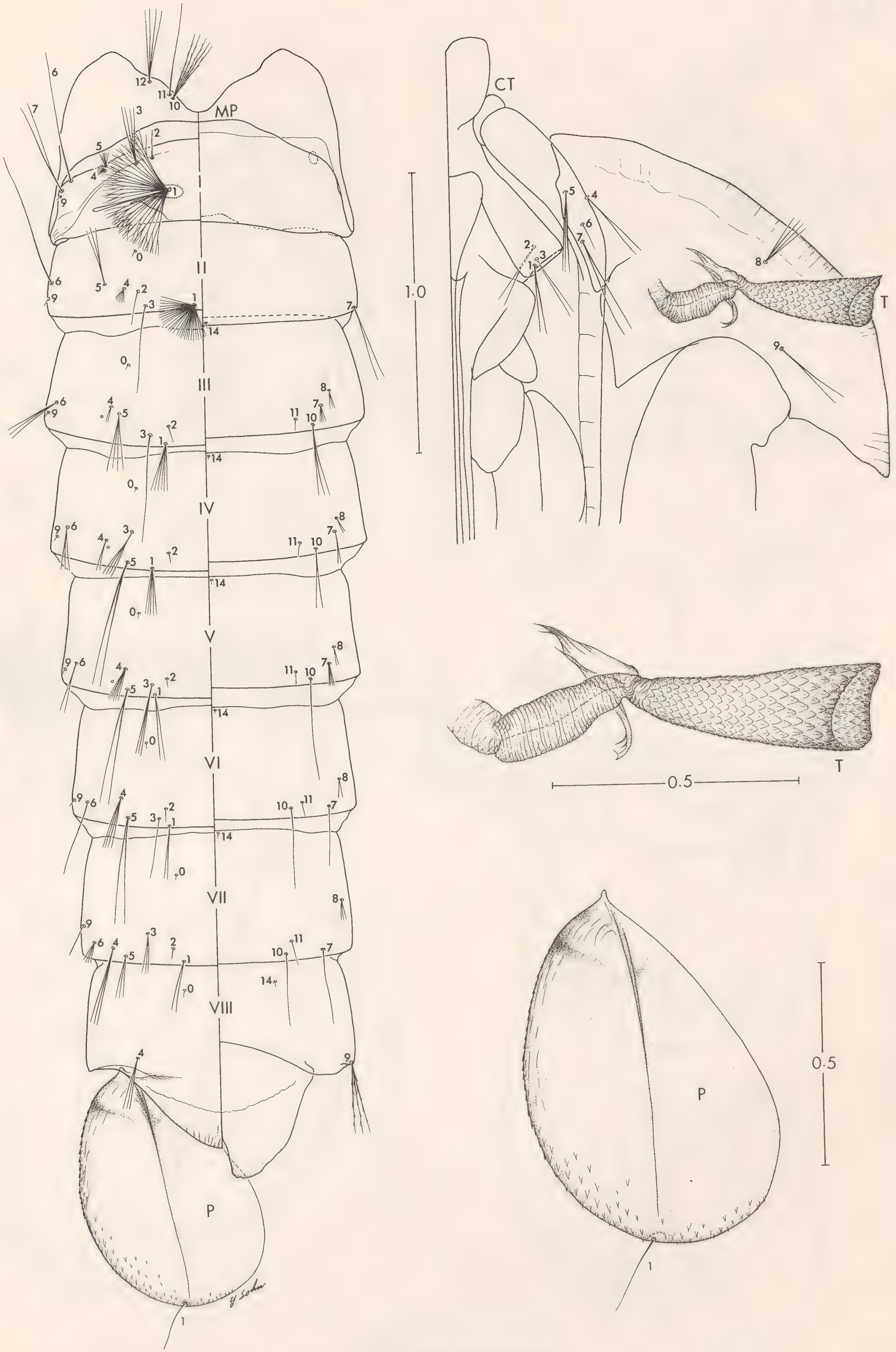
butleri

Fig. 38



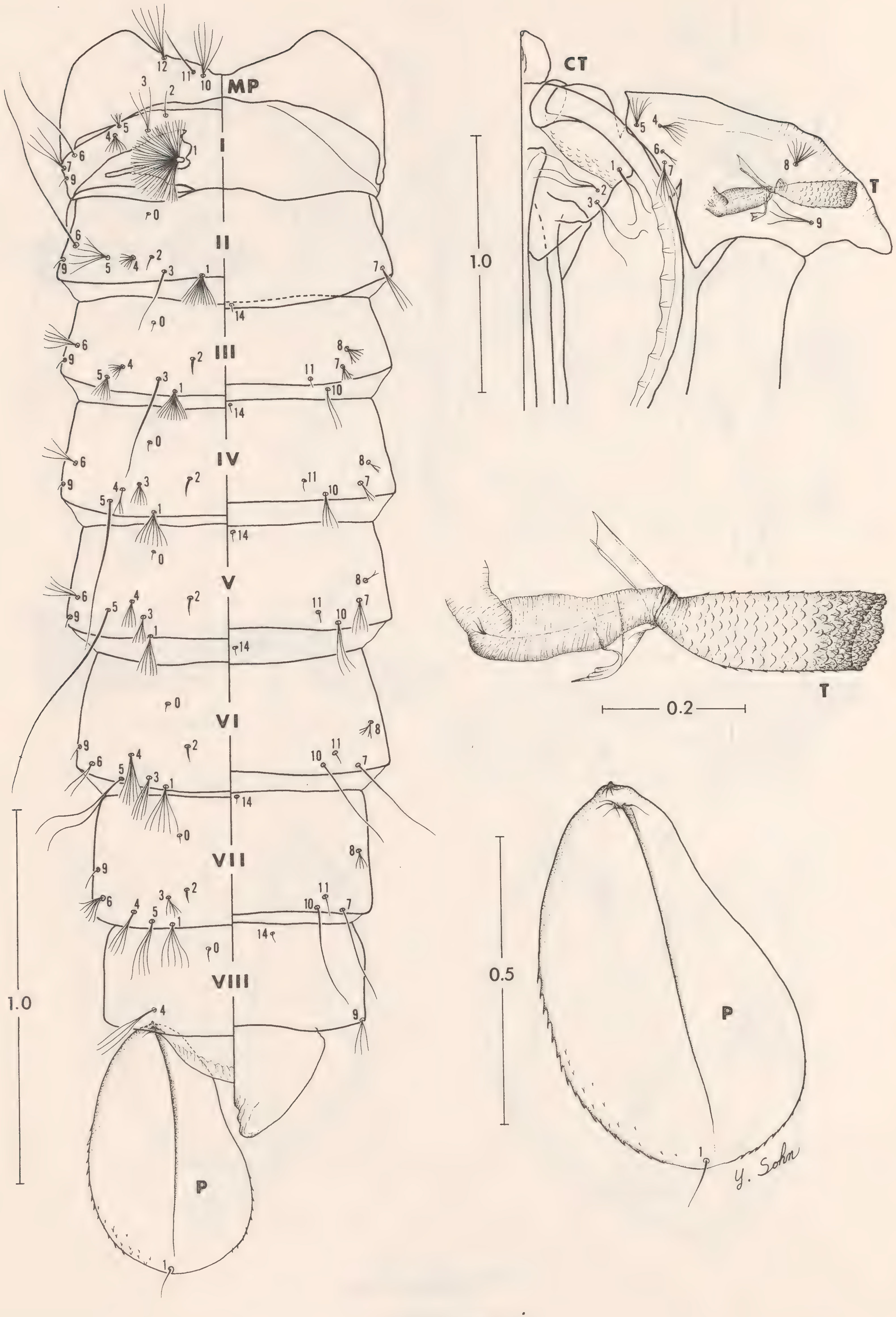
carmenti

Fig. 39



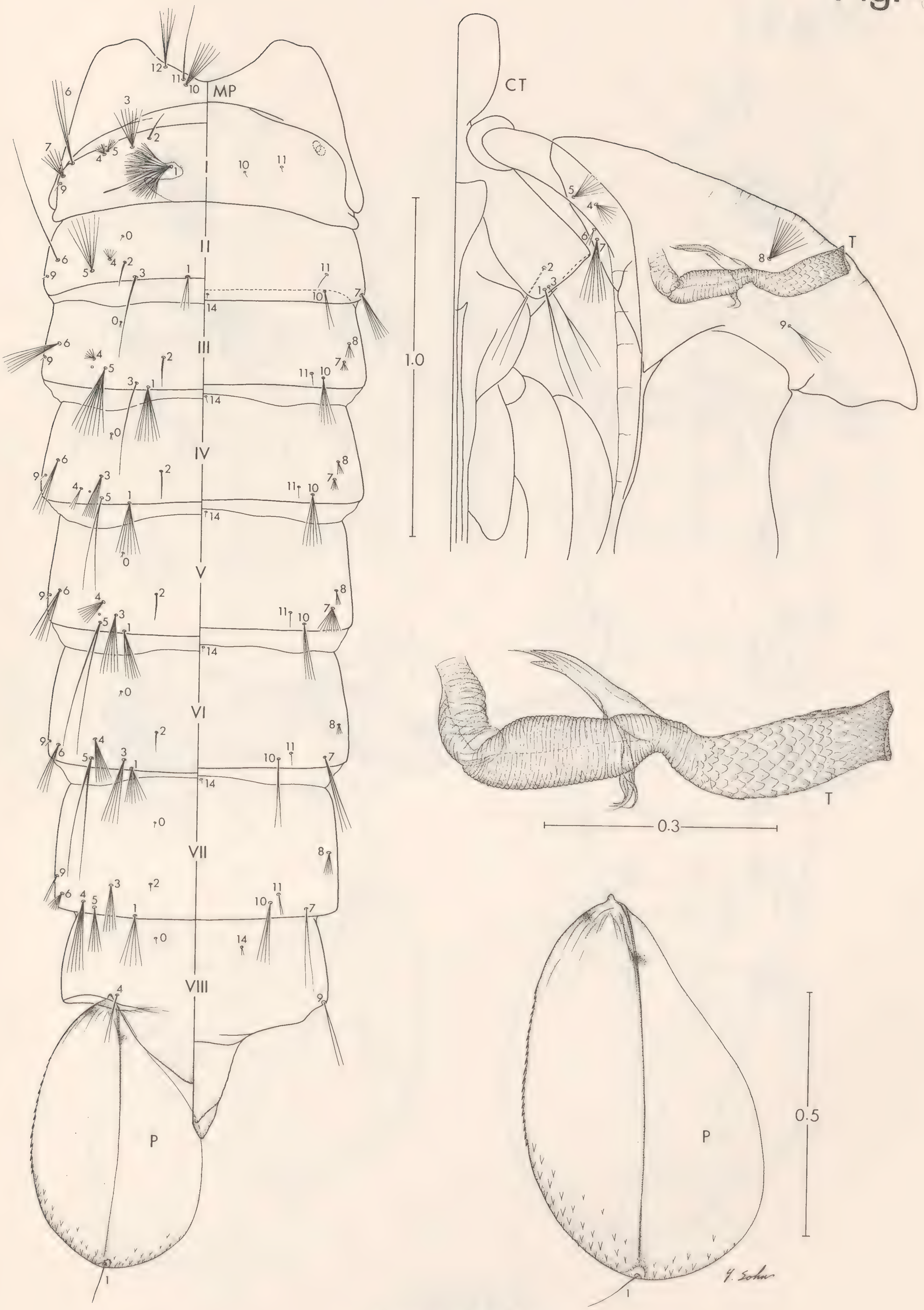
clavatus

Fig. 40



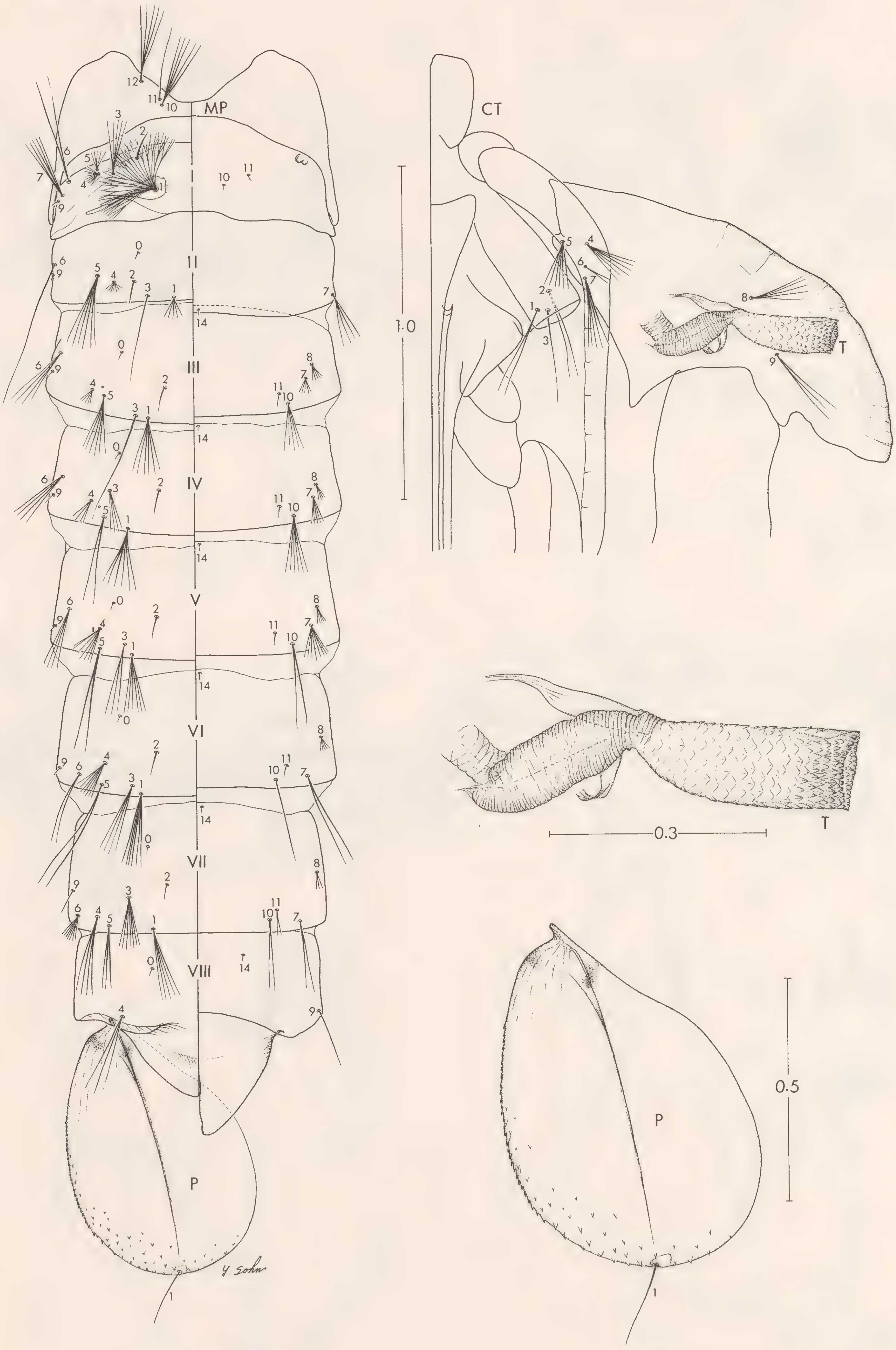
consonensis

Fig. 41



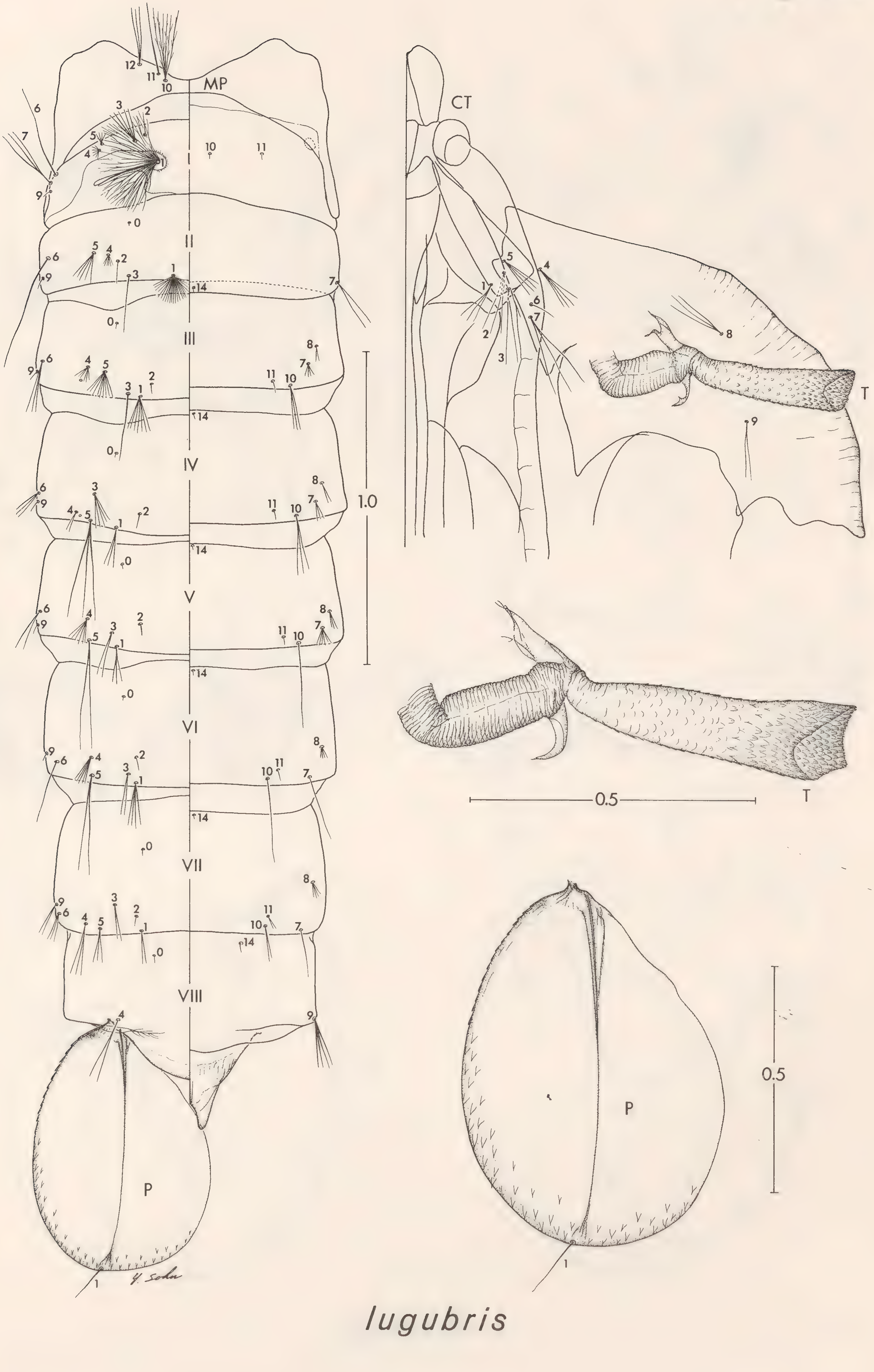
cyrtolabis

Fig. 42



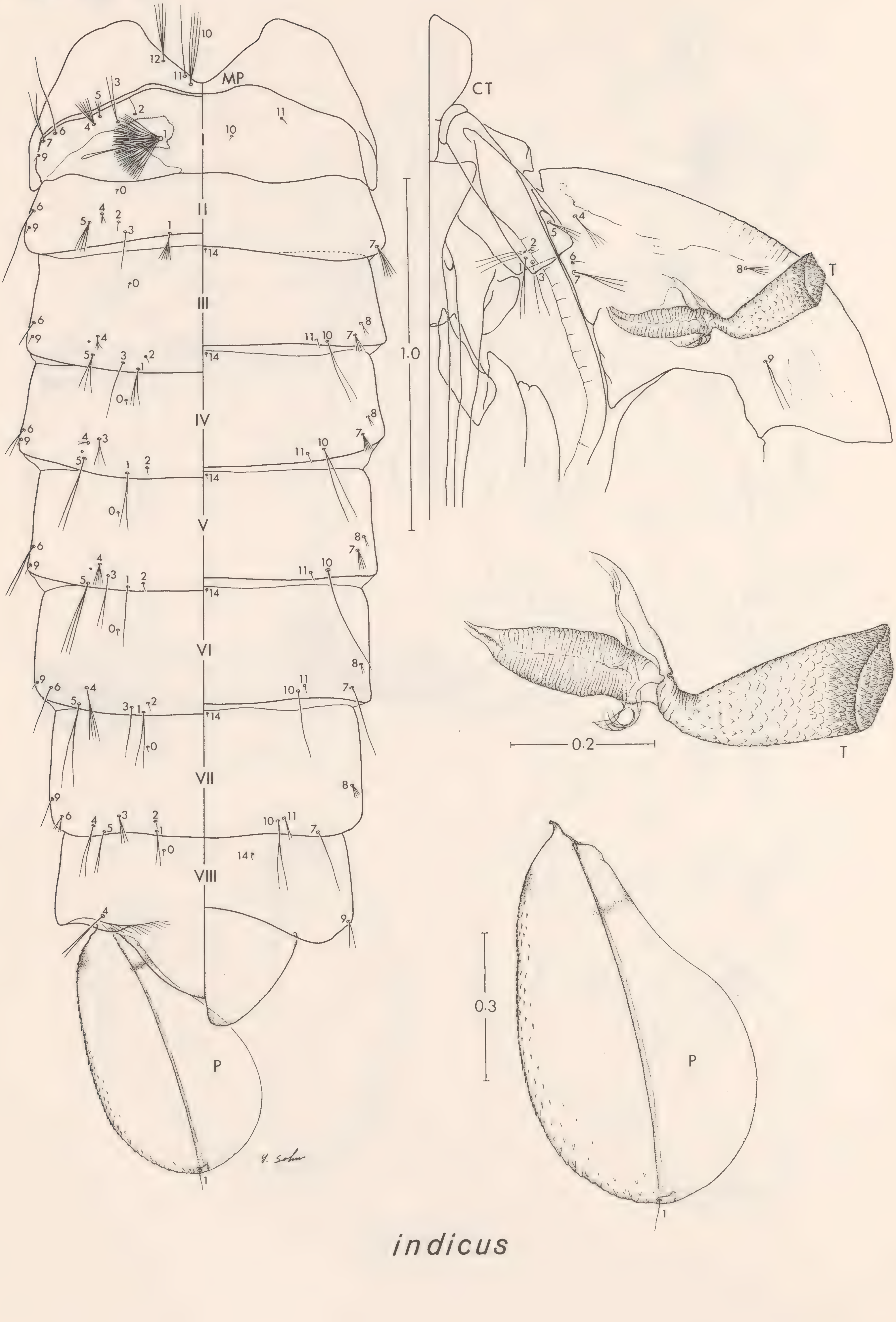
leicesteri

Fig. 43



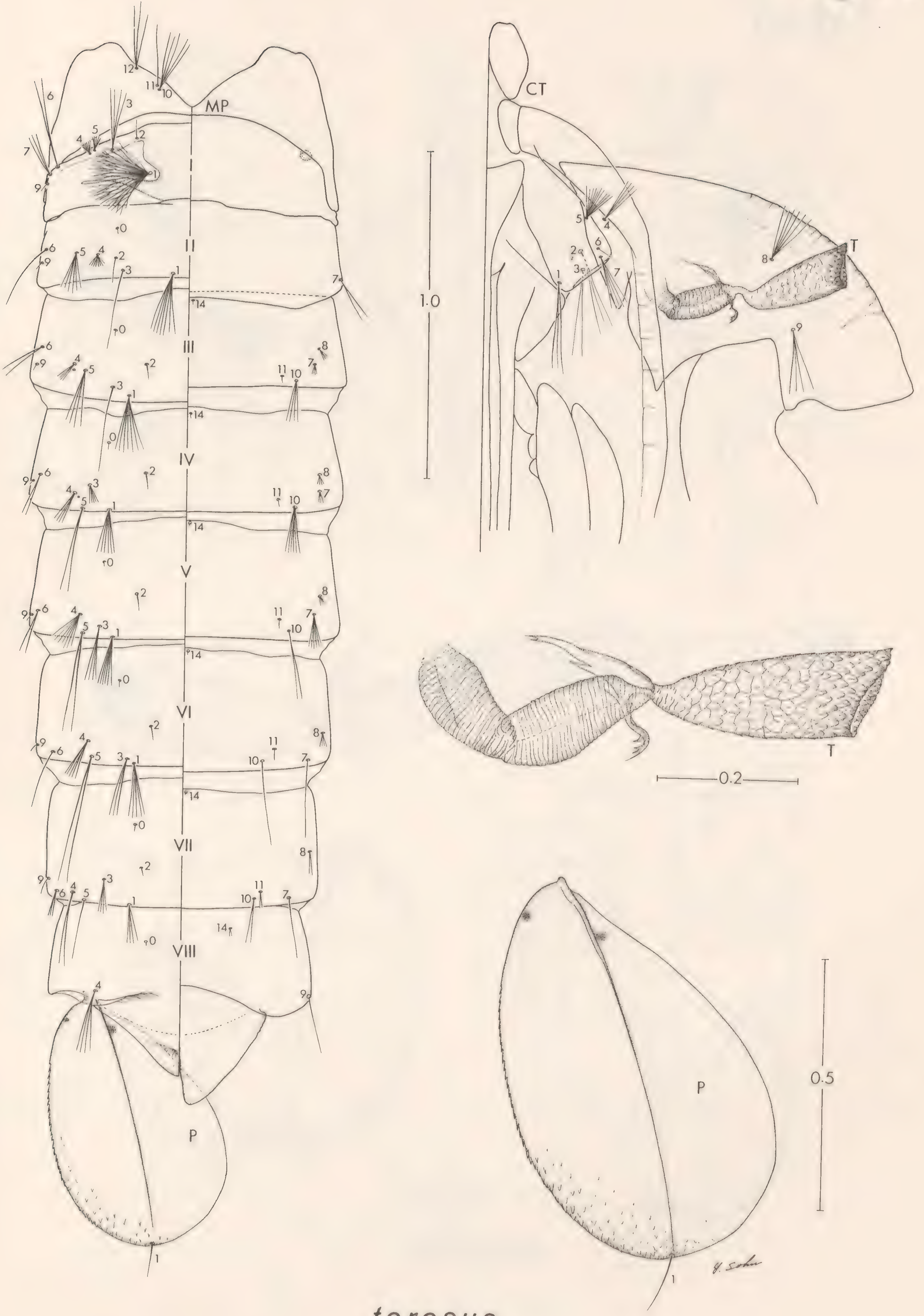
lugubris

Fig. 44



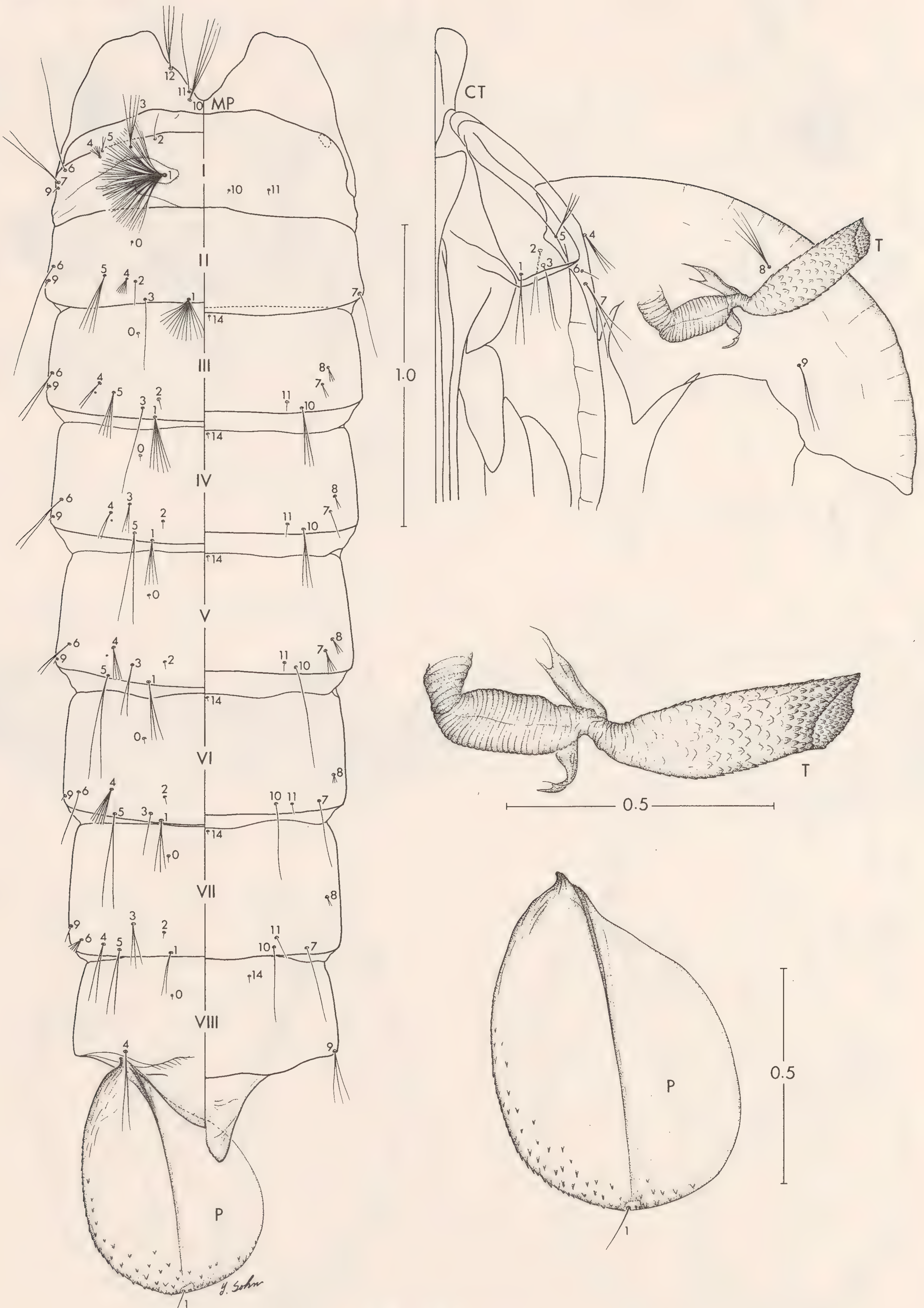
indicus

Fig. 45



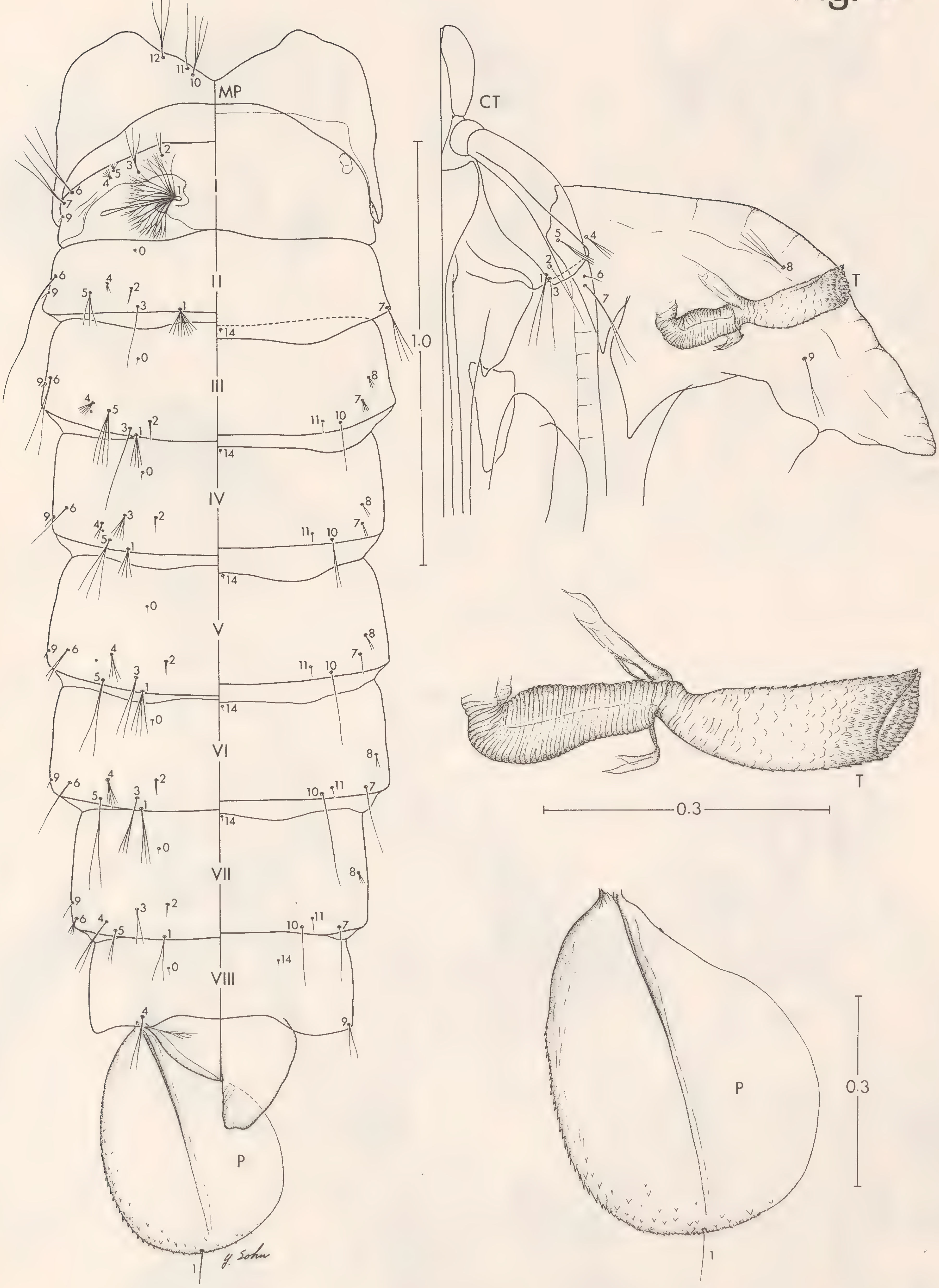
torosus

Fig. 46



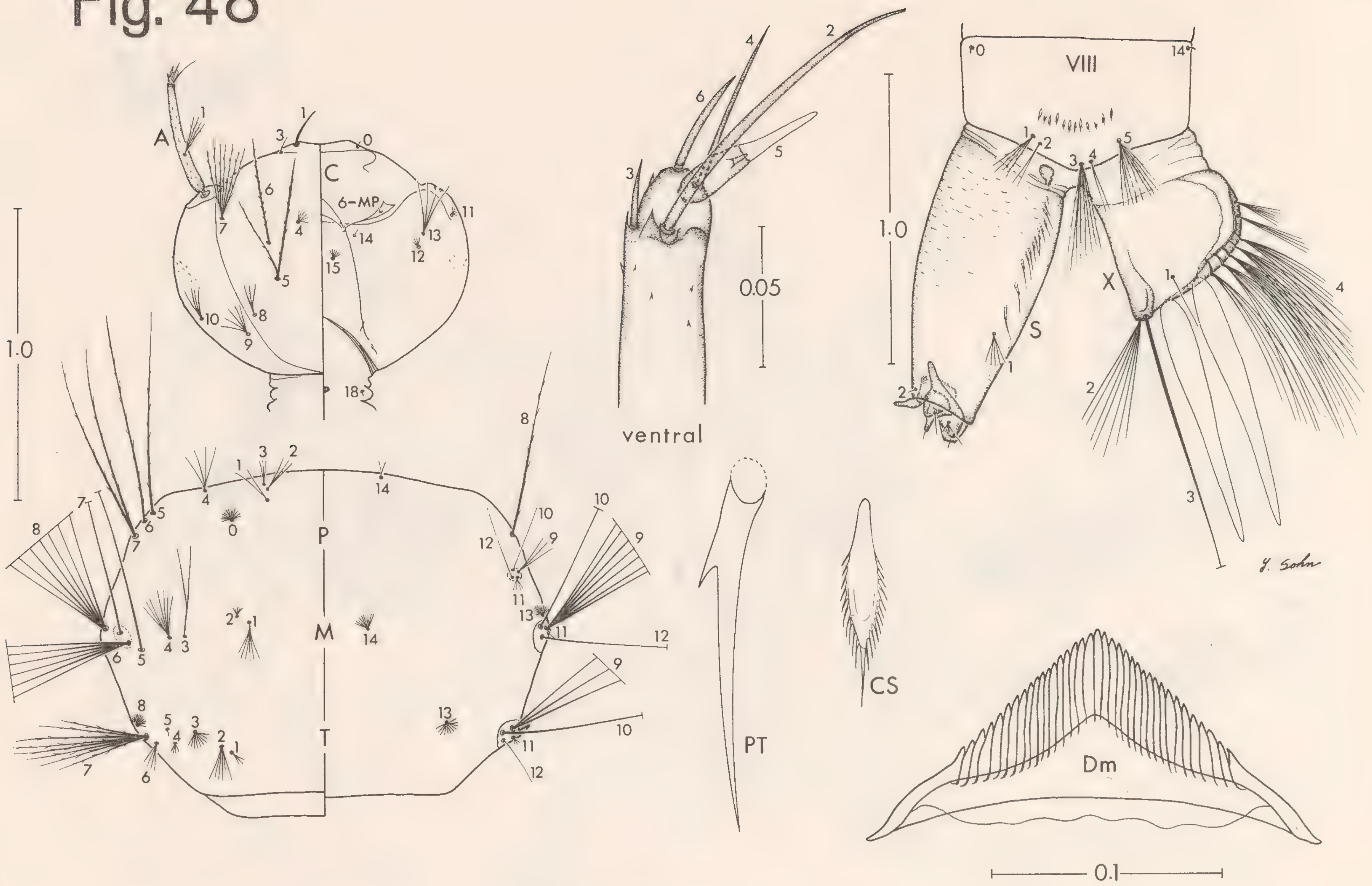
vallistris

Fig. 47

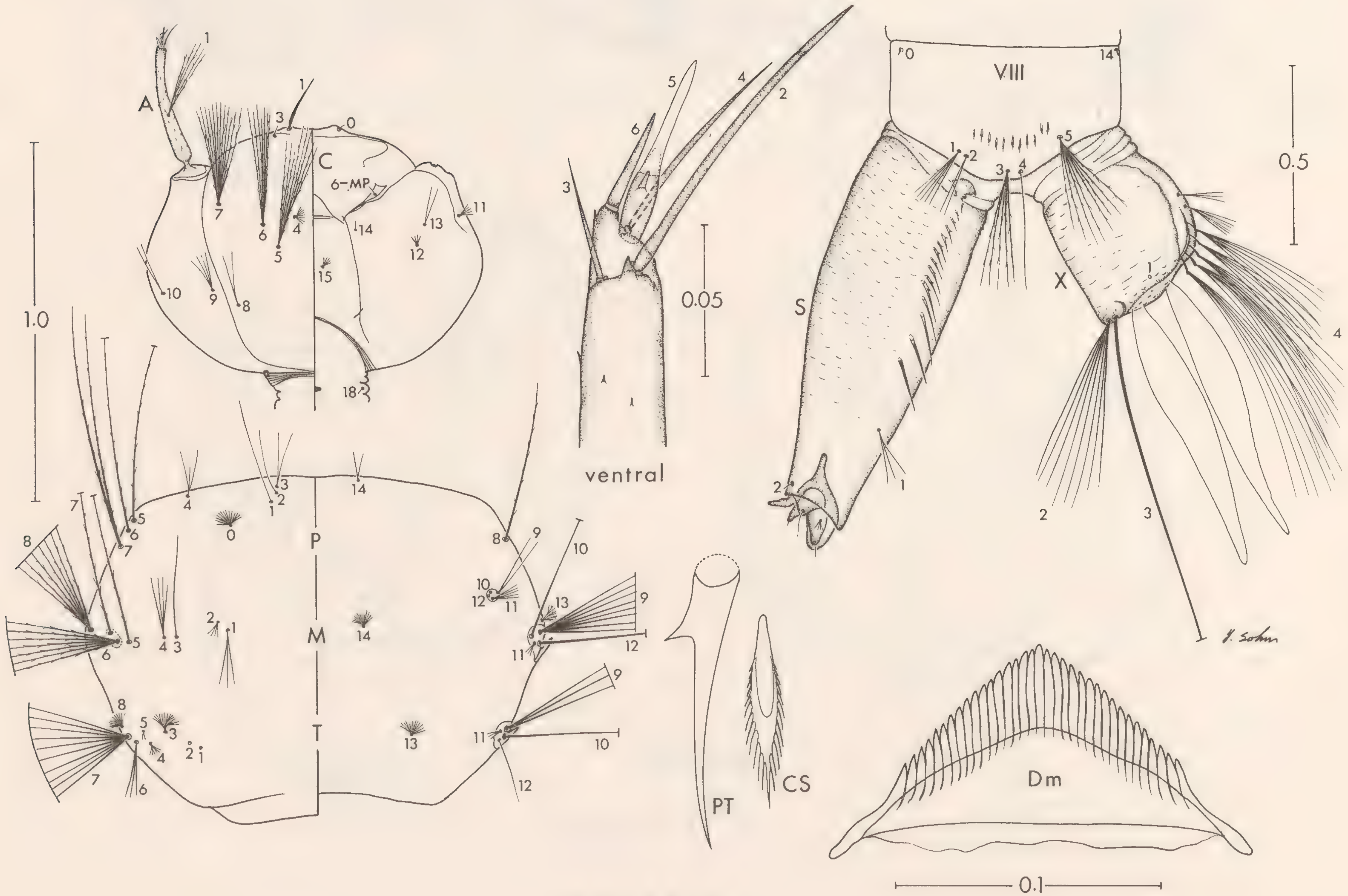


yusafi

Fig. 48

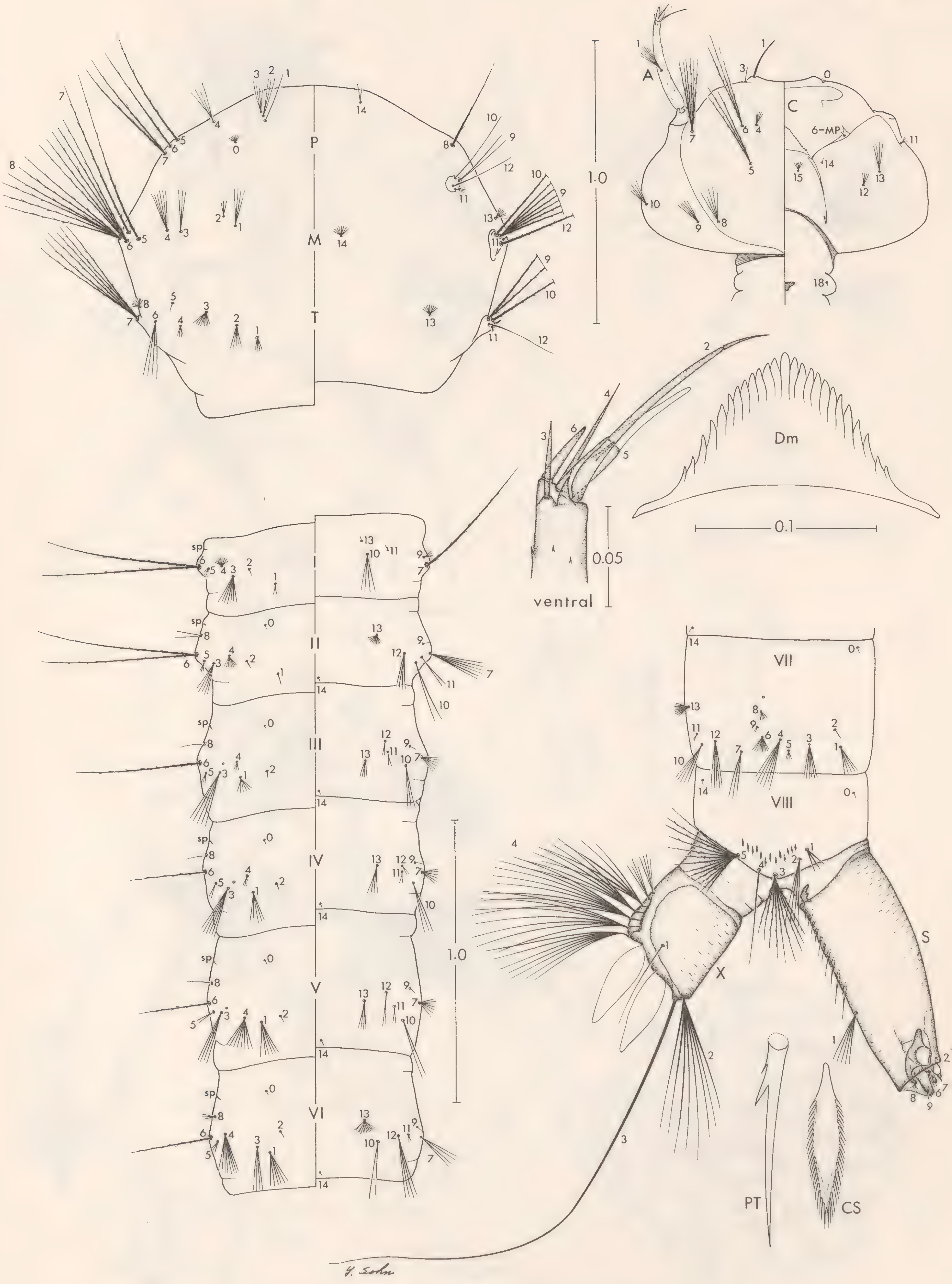


torosus



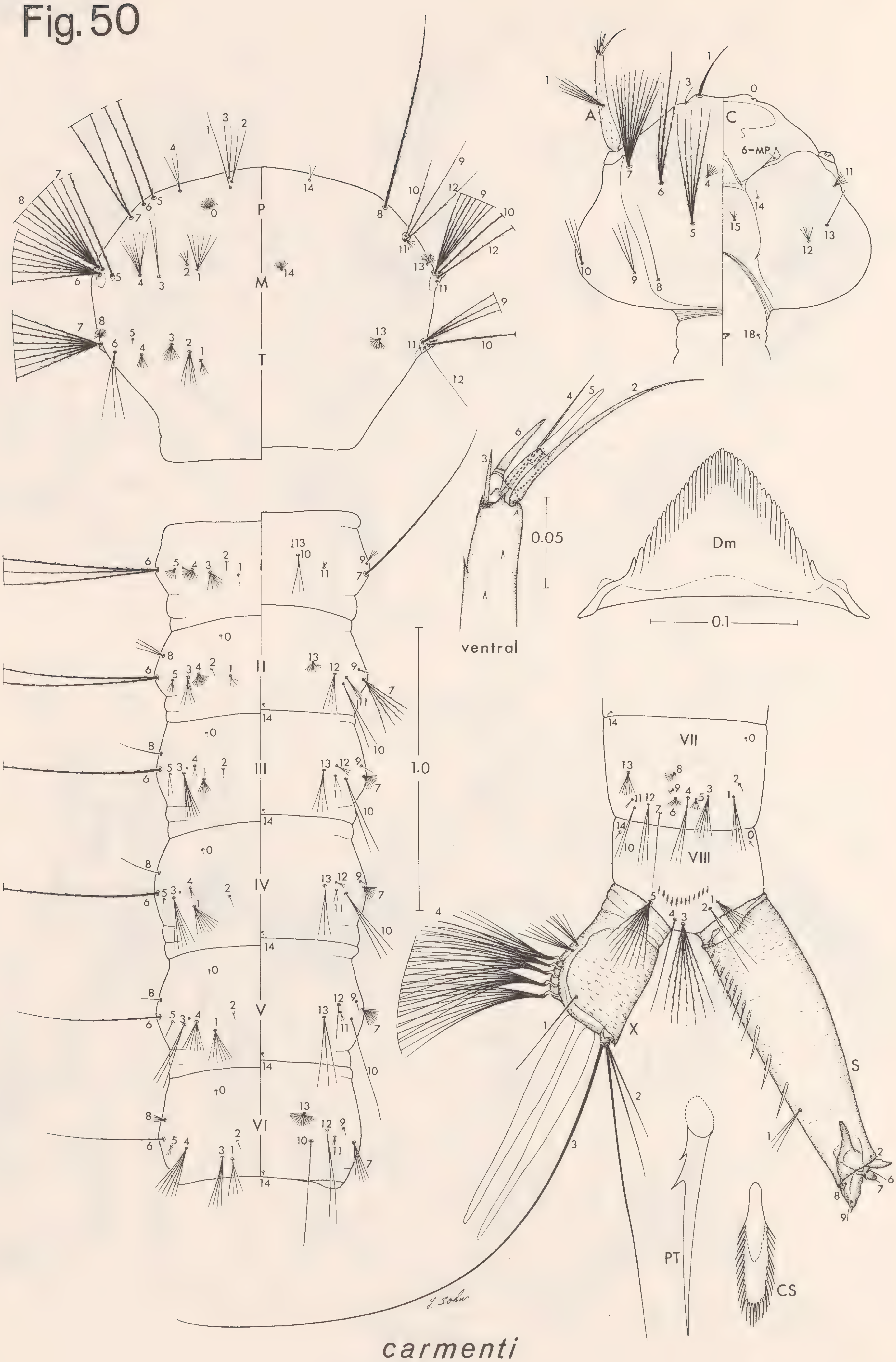
adustus

Fig. 49



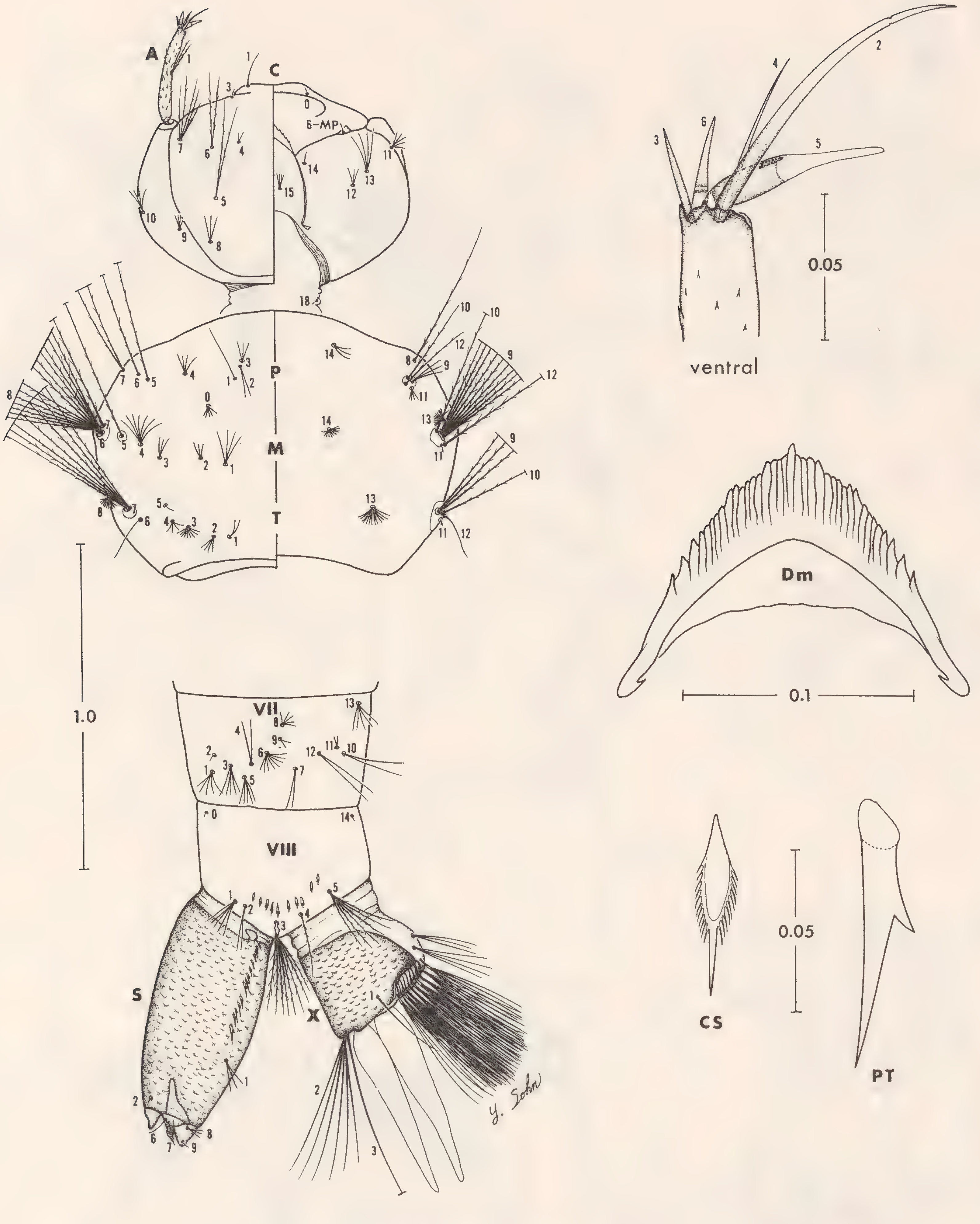
butleri

Fig. 50

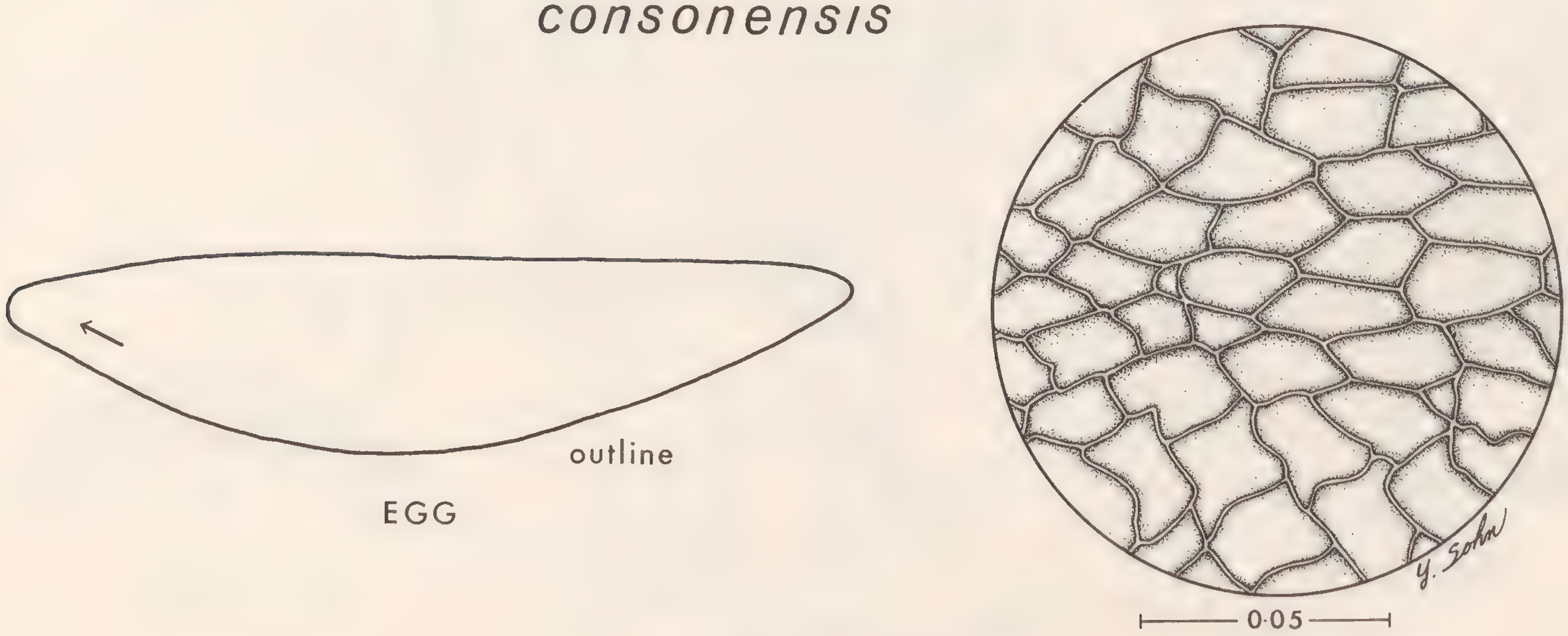


carmenti

Fig.51



consonensis



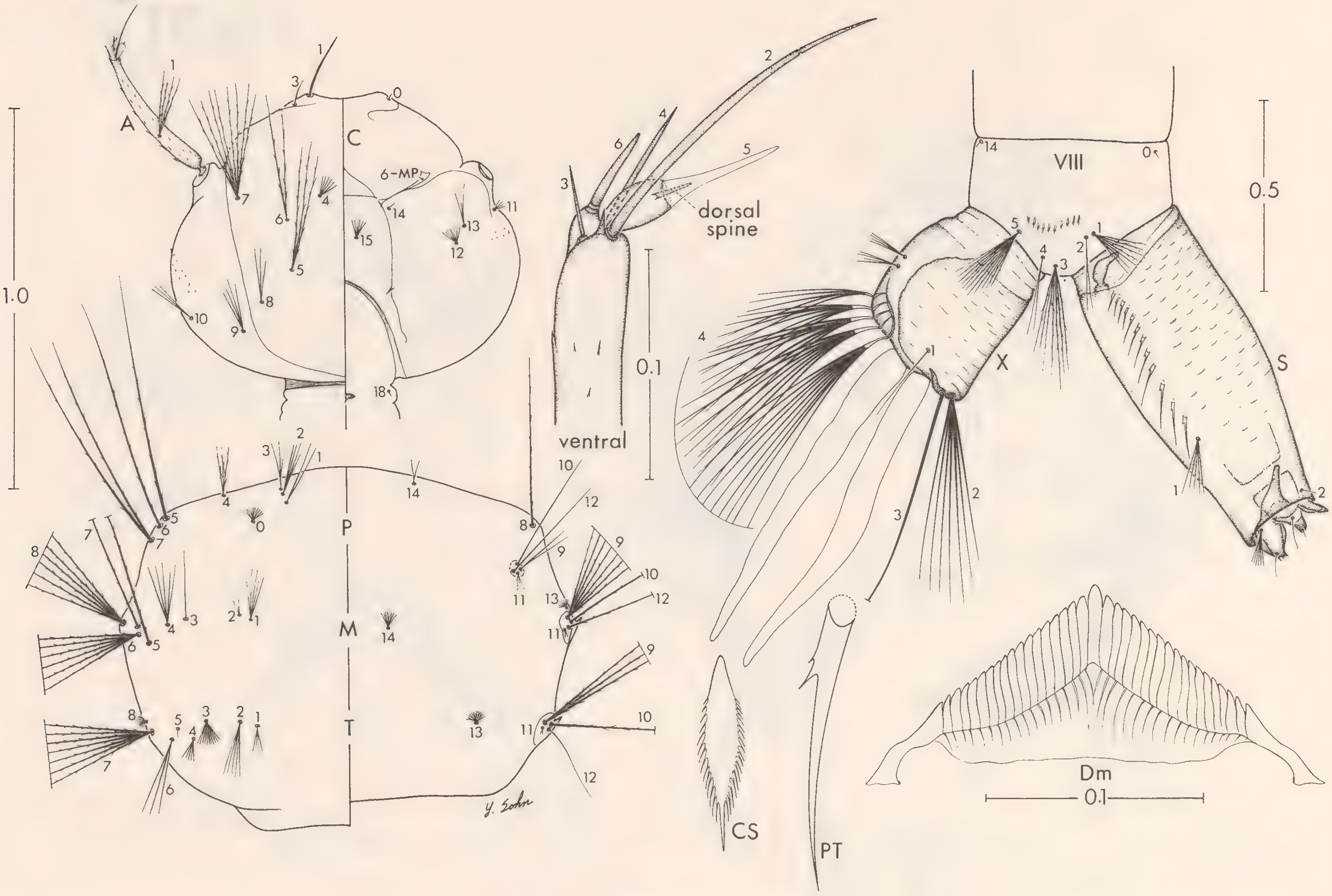
outline

EGG

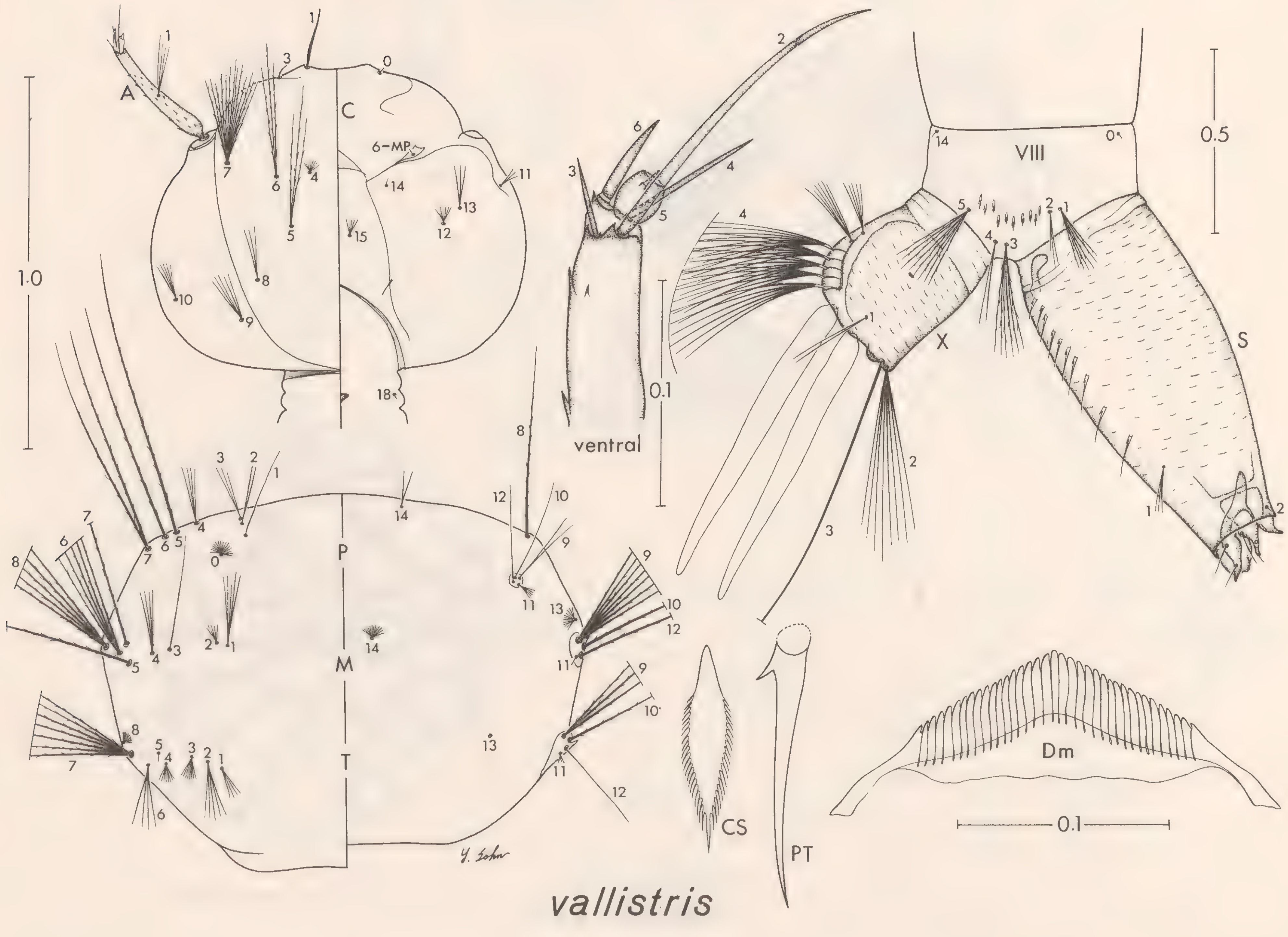
chorion reticulation

dux

Fig. 52

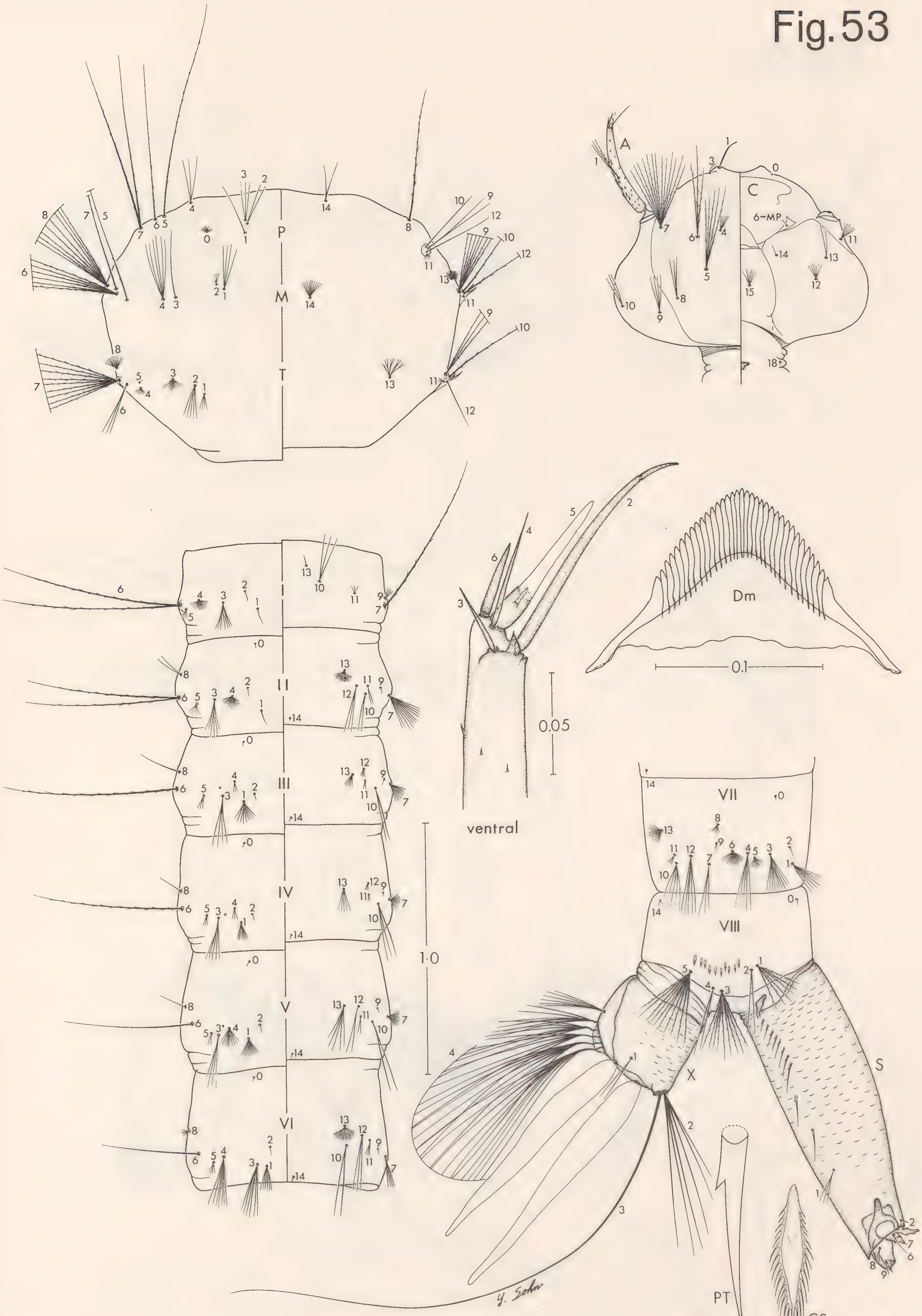


cyrtolabis



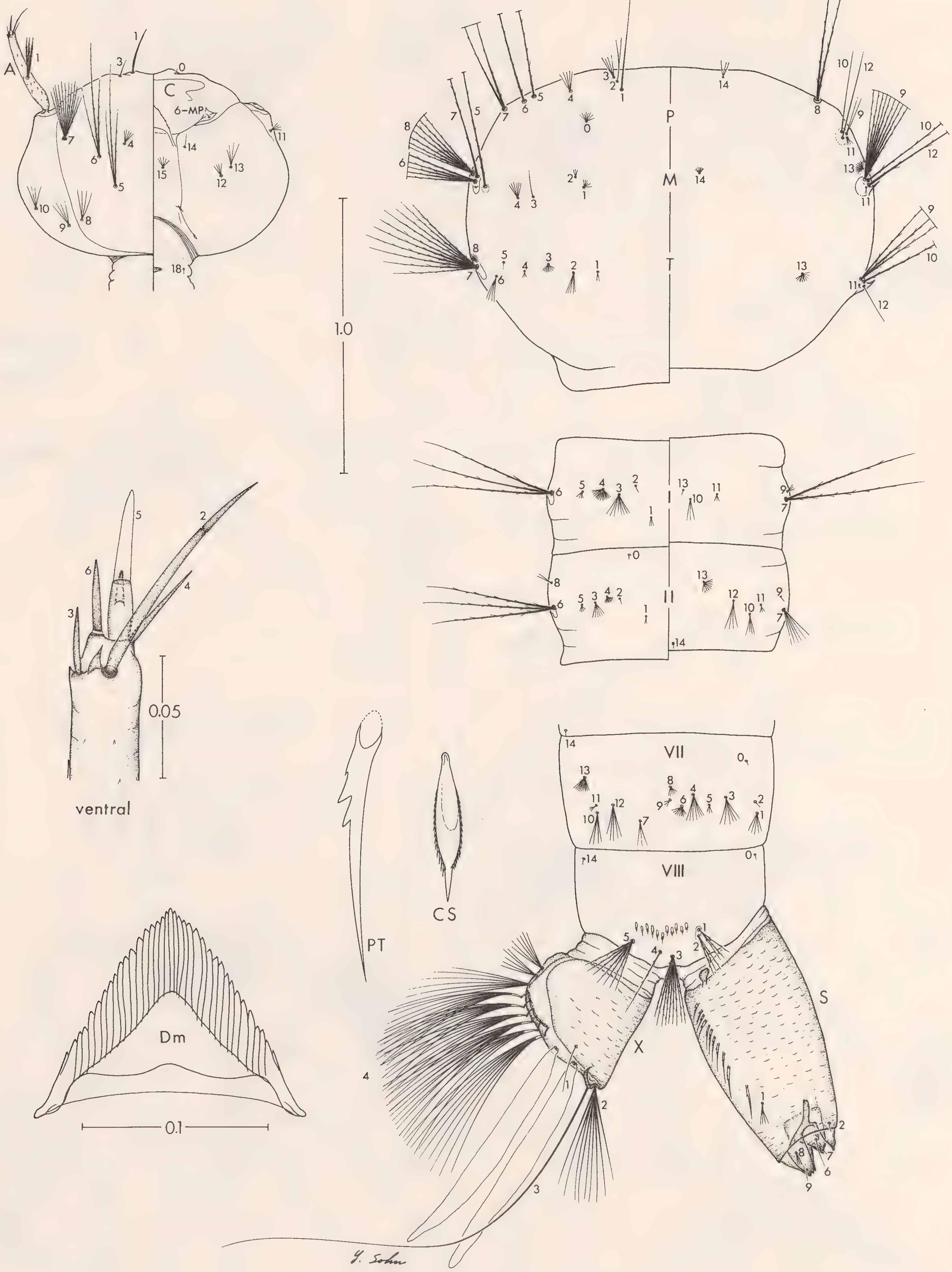
vallistris

Fig. 53



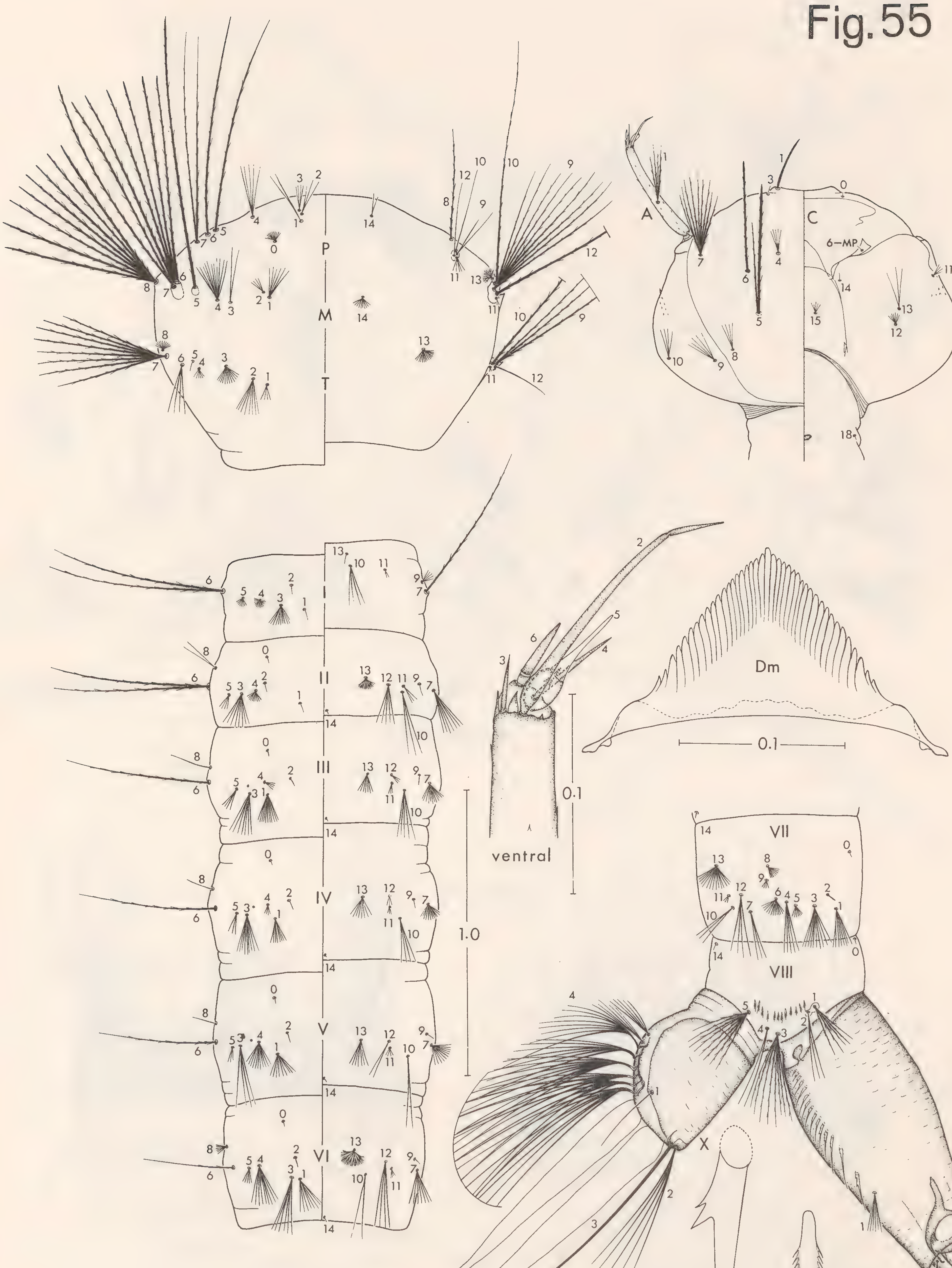
gibbosus

Fig. 54



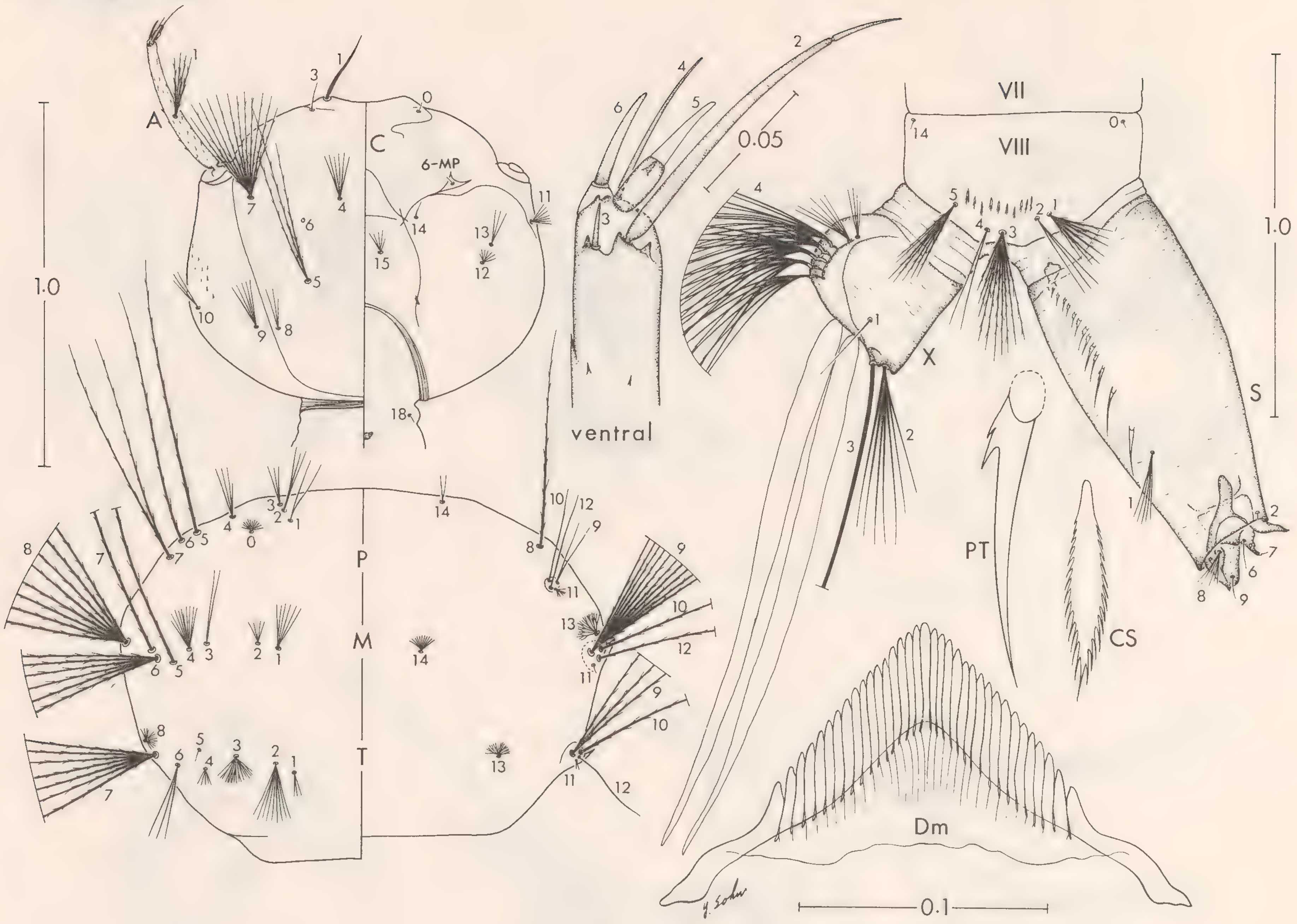
indicus

Fig. 55

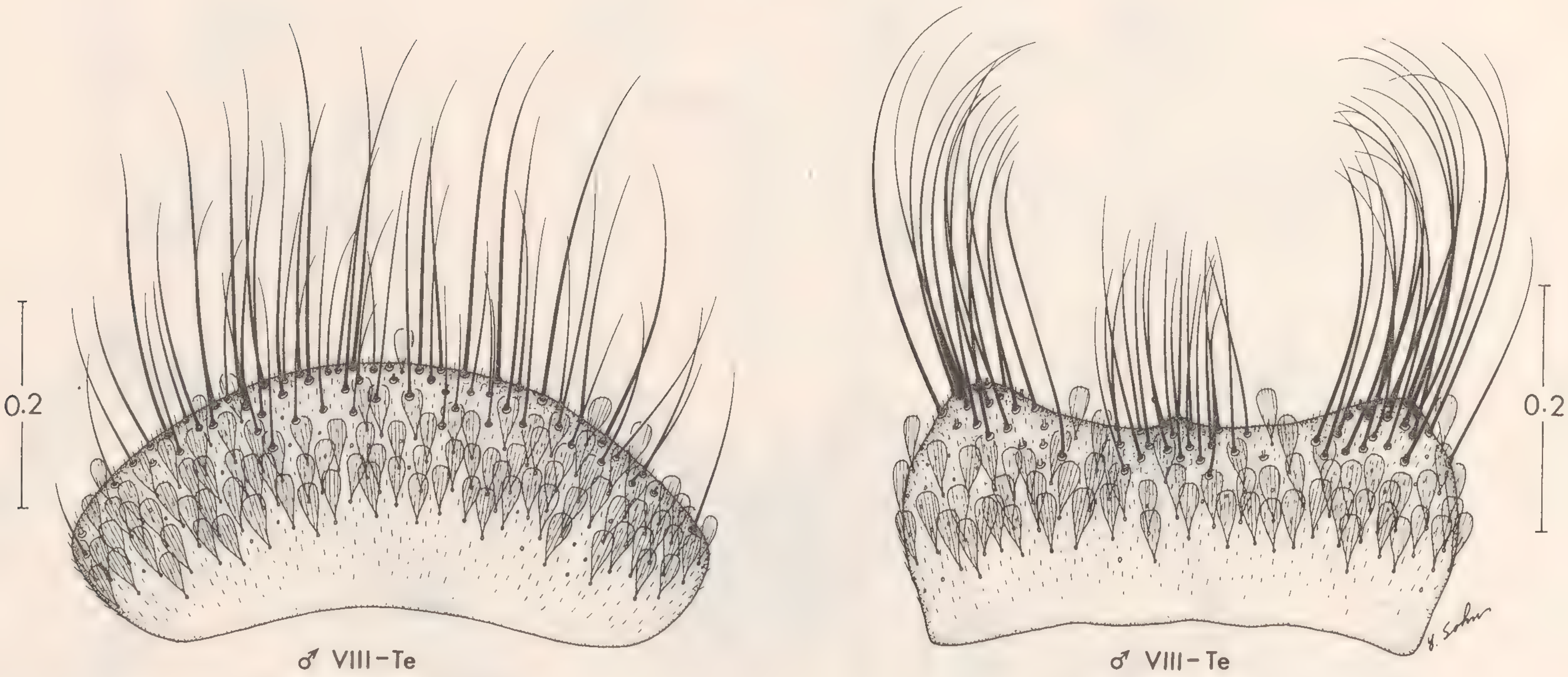


uncus

Fig. 56

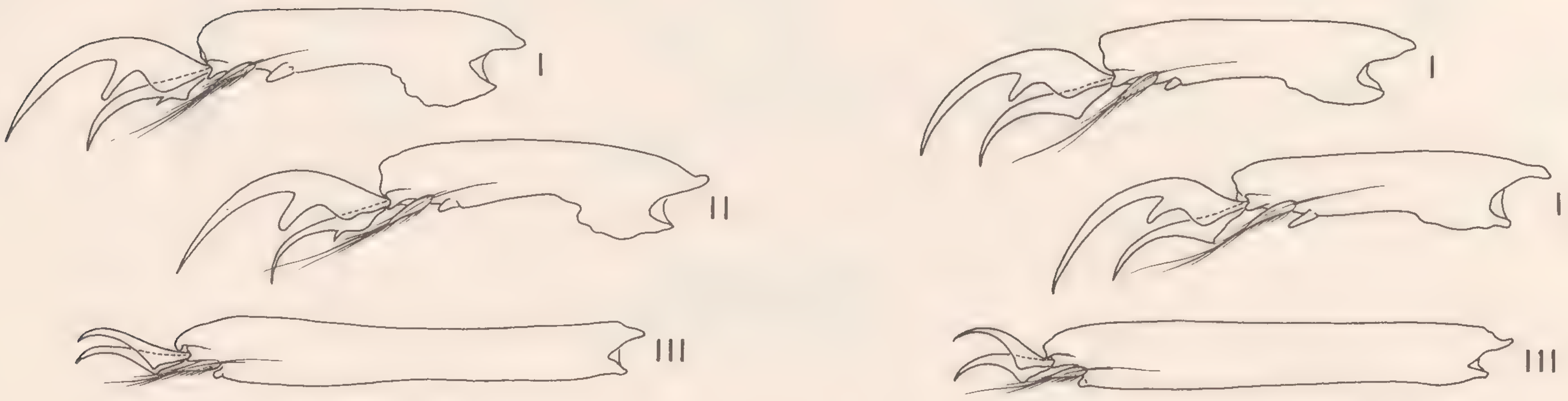


leicesteri



♂ VIII-Te
andamanensis

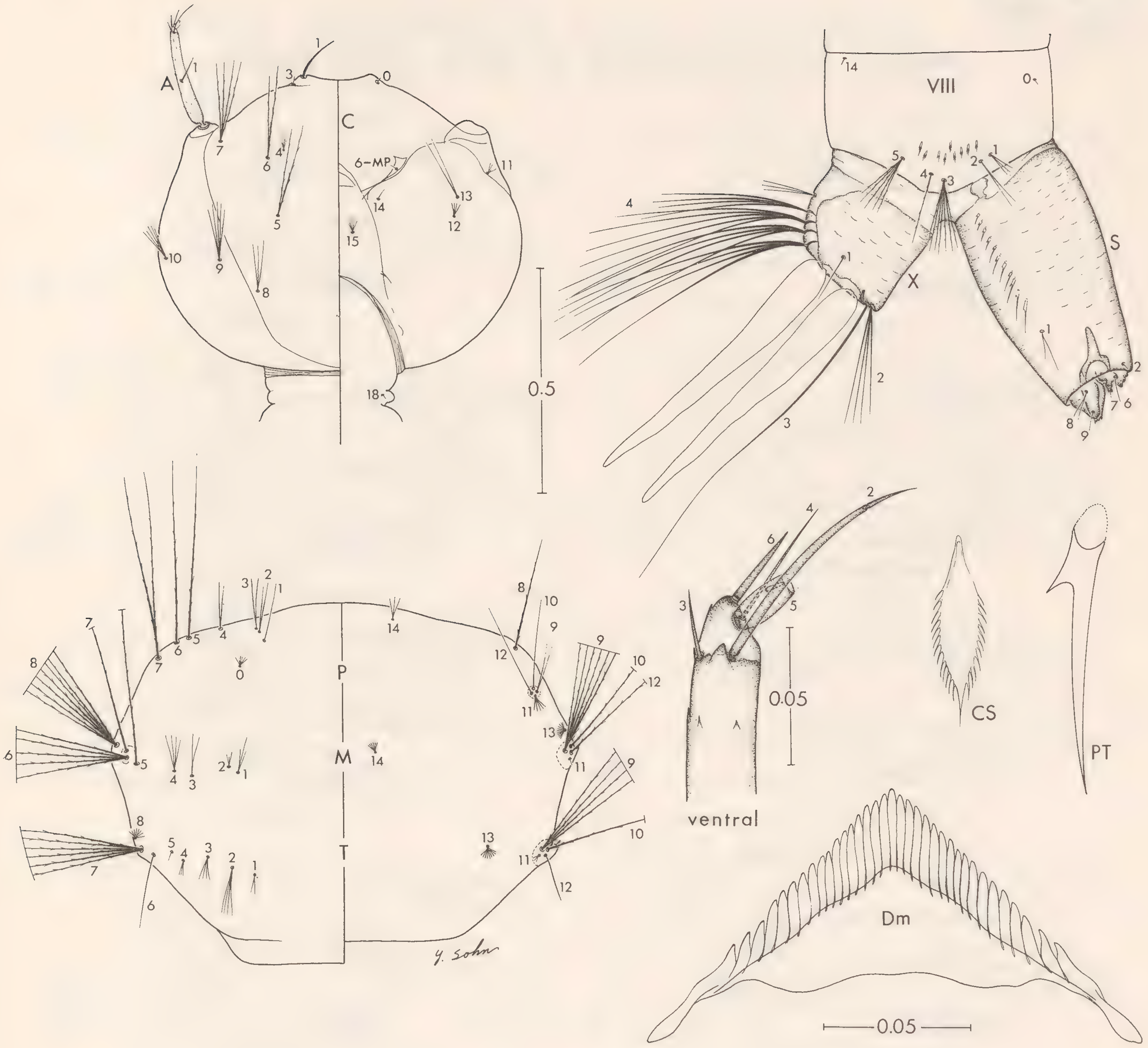
♂ VIII-Te
butleri



sohni ♂.

leicesteri ♂

Fig.57



yusafi

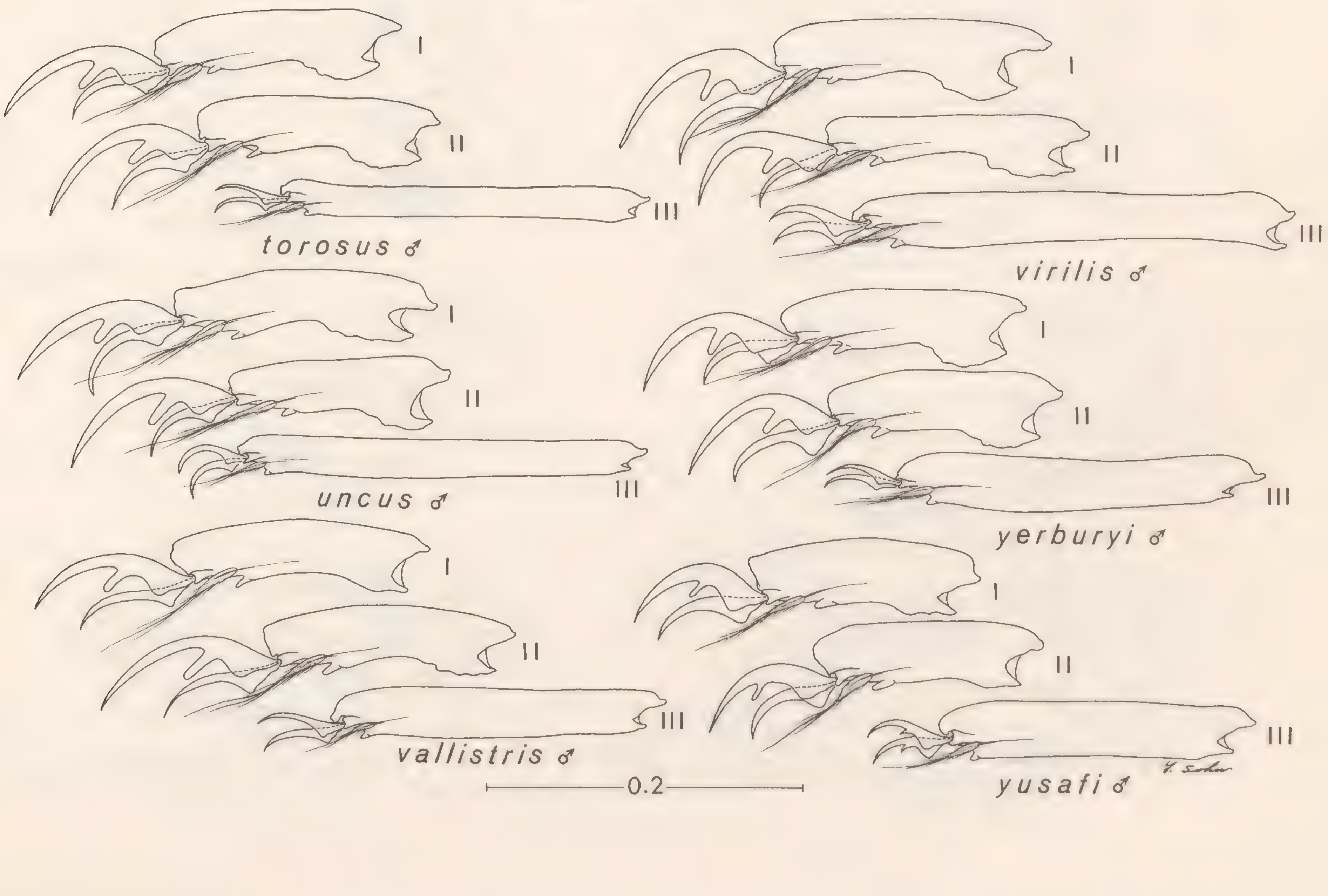
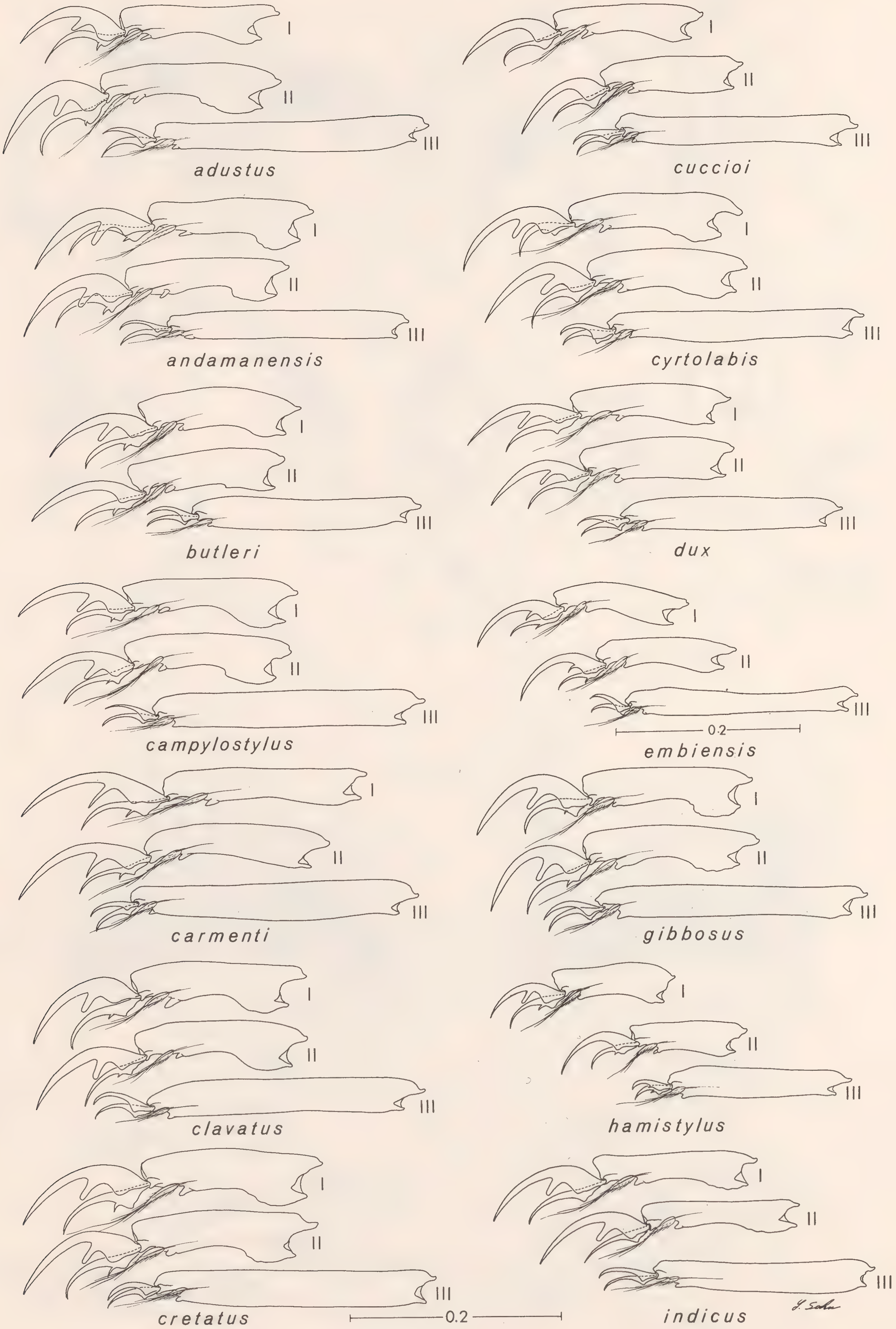


Fig. 58

MALE TARSOMERES 5 AND POSTTARSI



adustus

cuccioi

andamanensis

cyrtolabis

butleri

dux

campylostylus

embiensis

carmenti

gibbosus

clavatus

hamistylus

cretatus

indicus

Fig. 59

MALE TARSOMERES 5 AND POSTTARSI

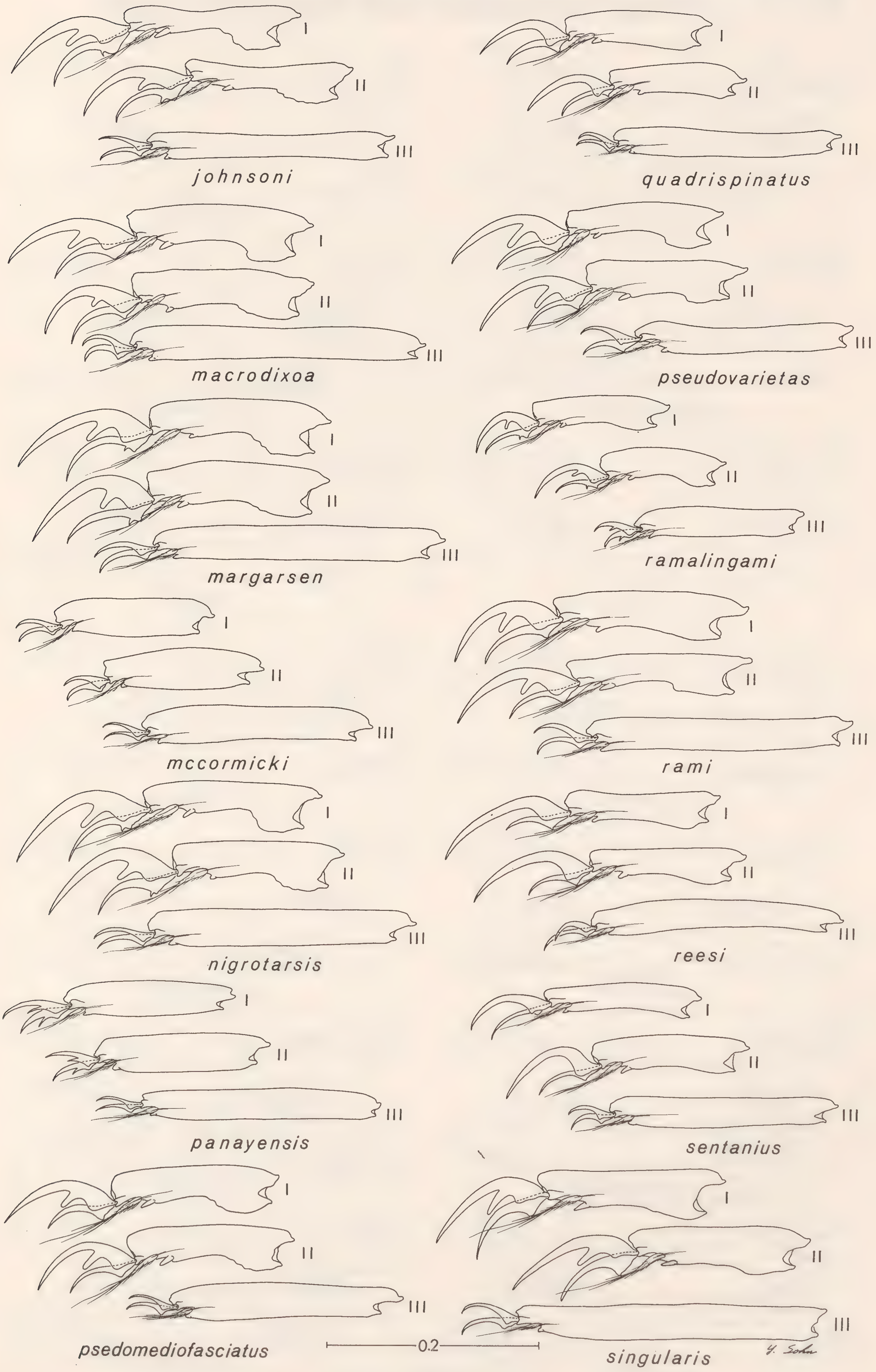


Fig. 60 FEMALE TARSOMERES 5 AND POSTTARSI

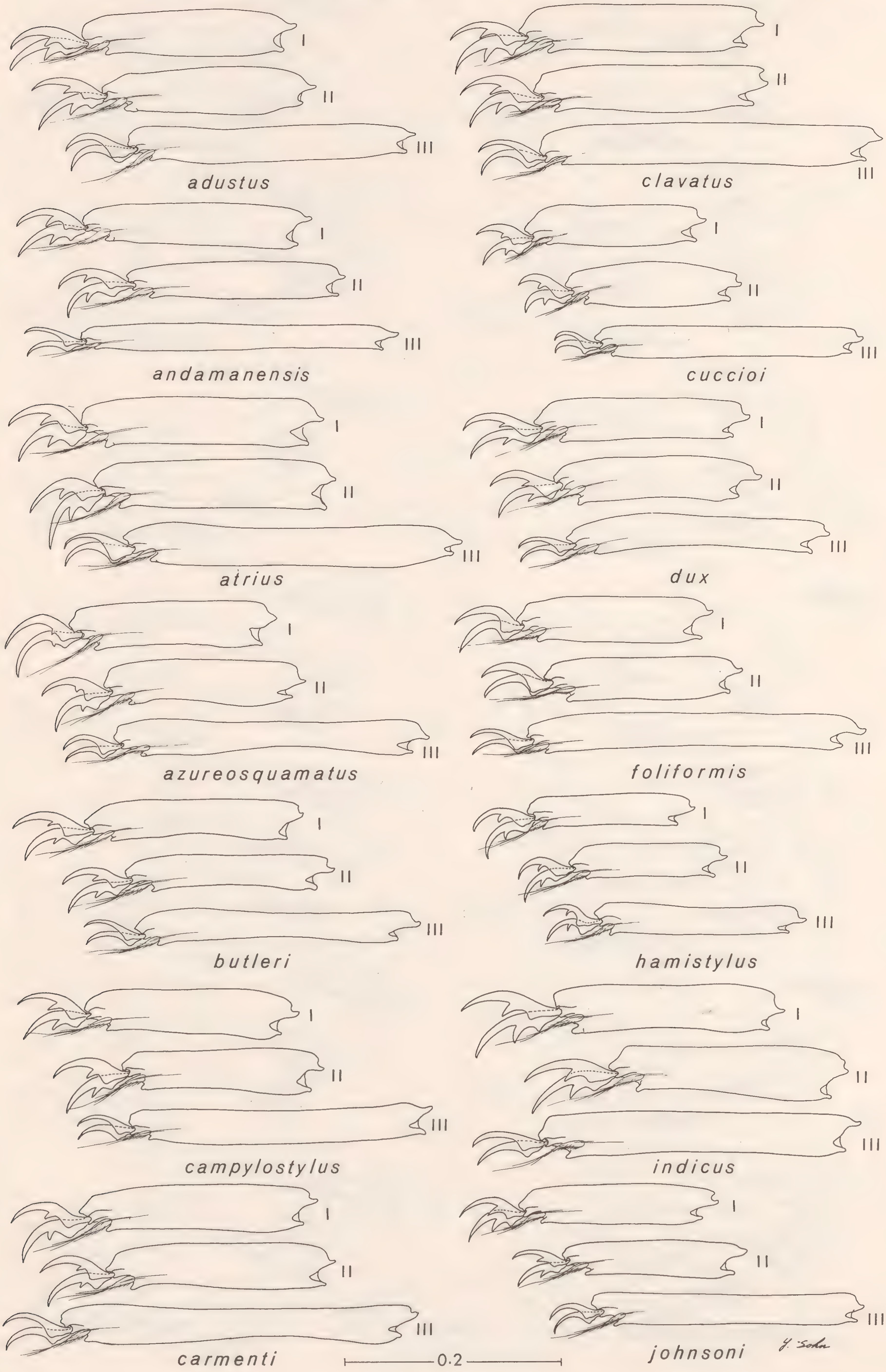
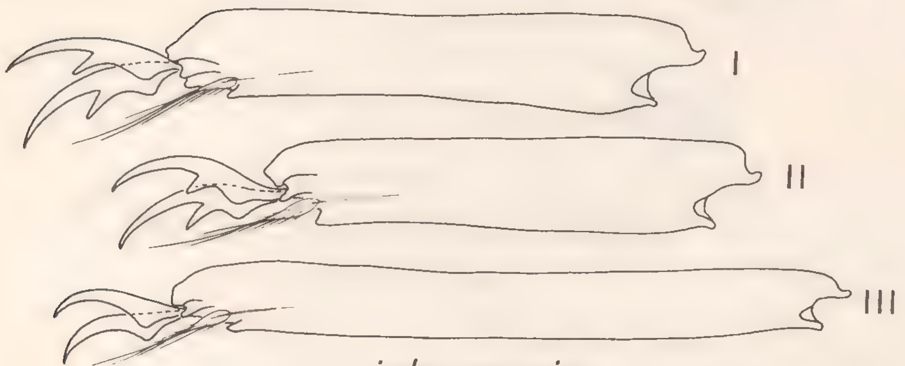
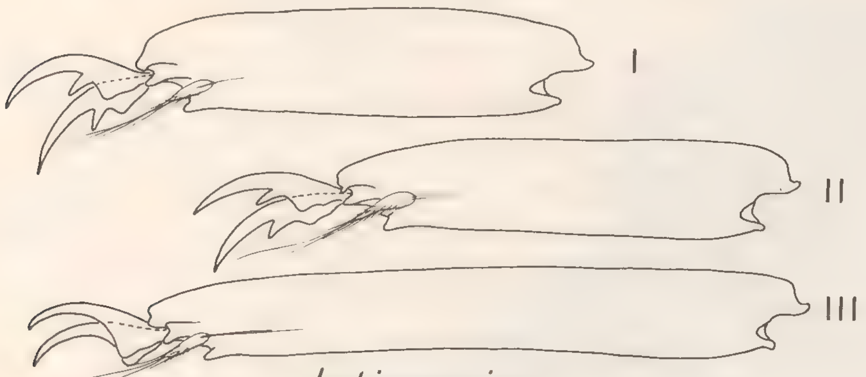


Fig. 61

FEMALE TARSOMERES 5 AND POSTTARSI



johorensis



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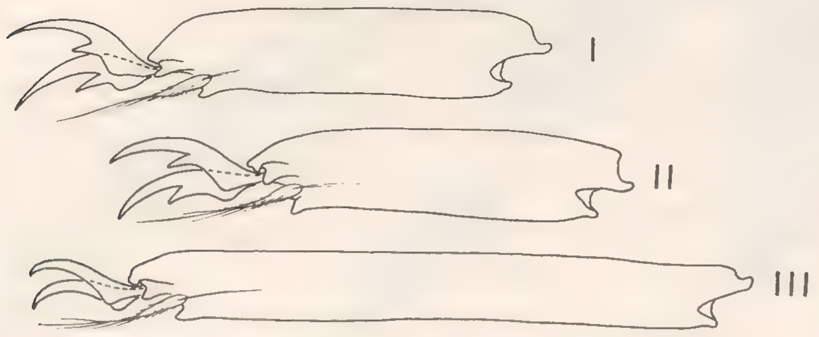
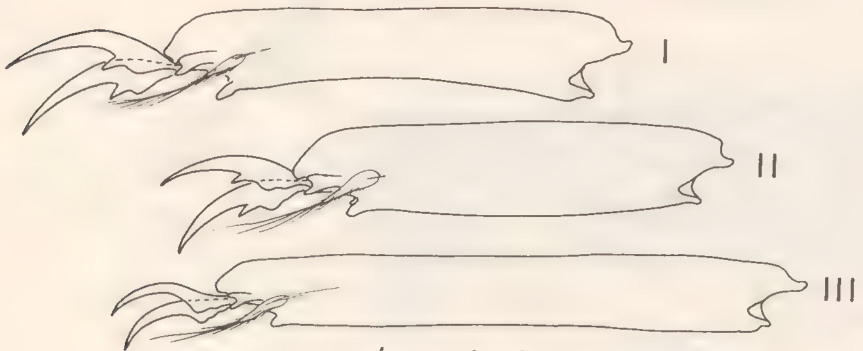


leicesteri



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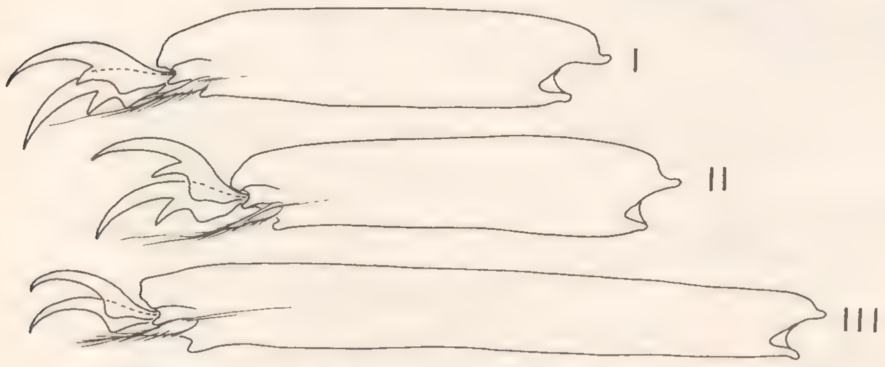

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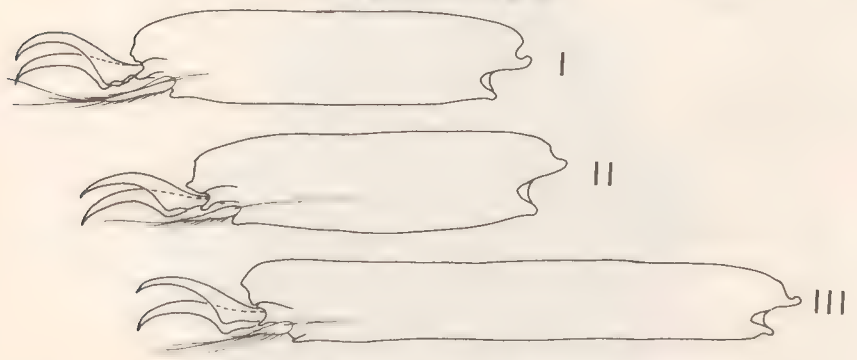
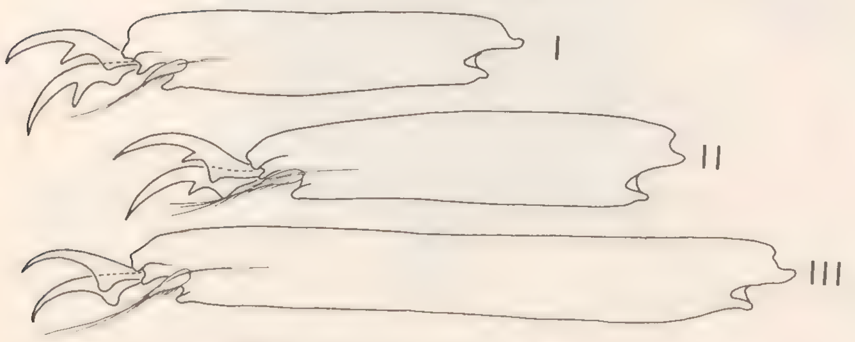


mccormicki



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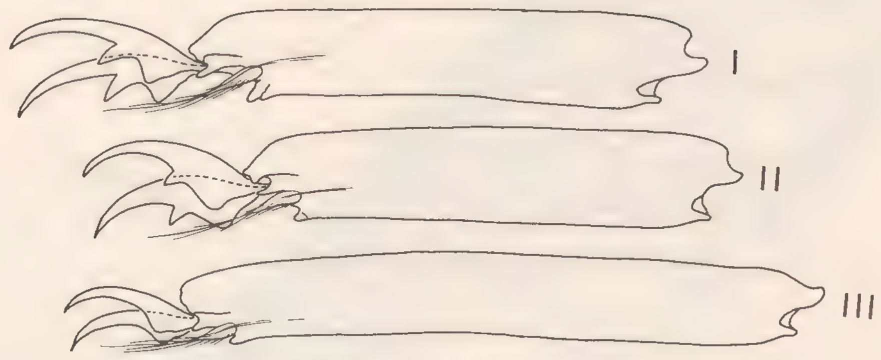
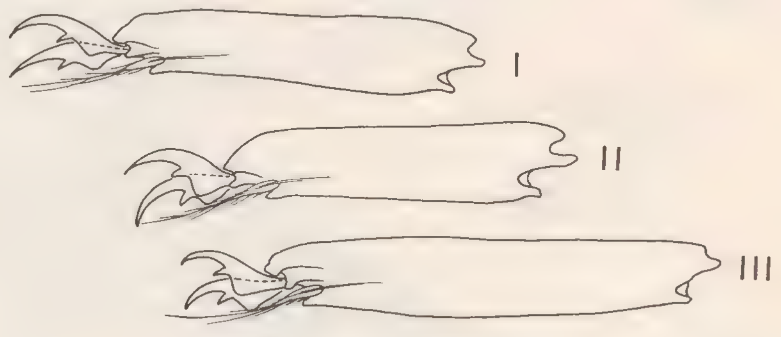
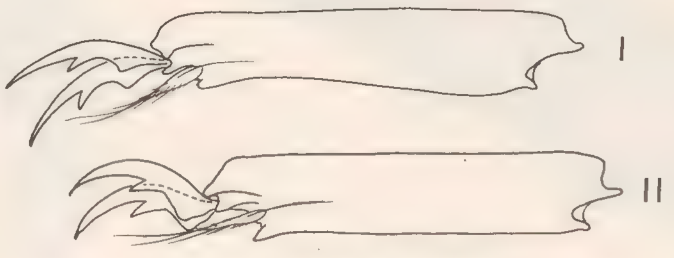


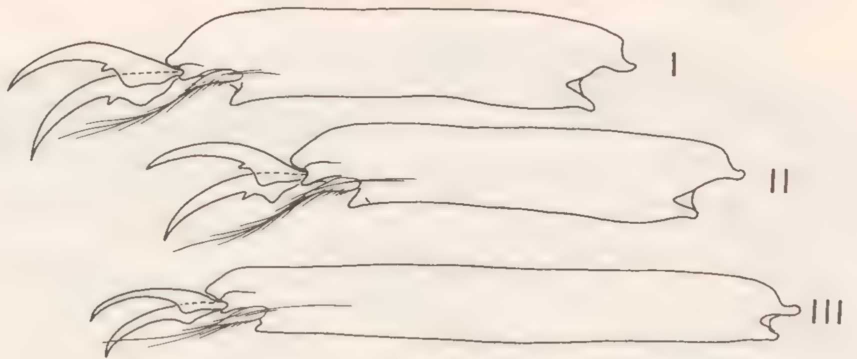
nigrotarsis



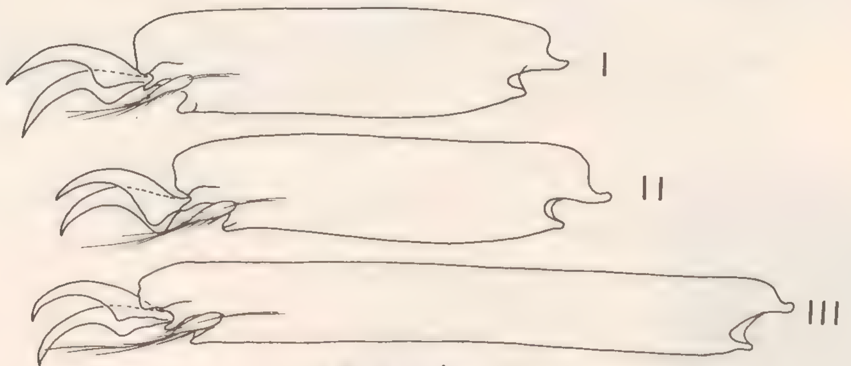
nobukonis



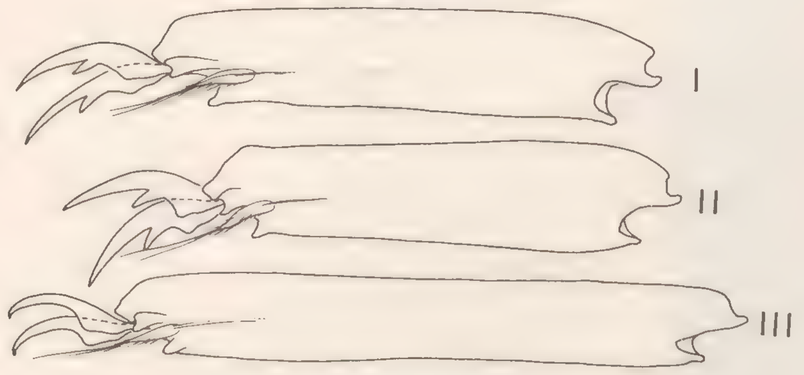
notabilis



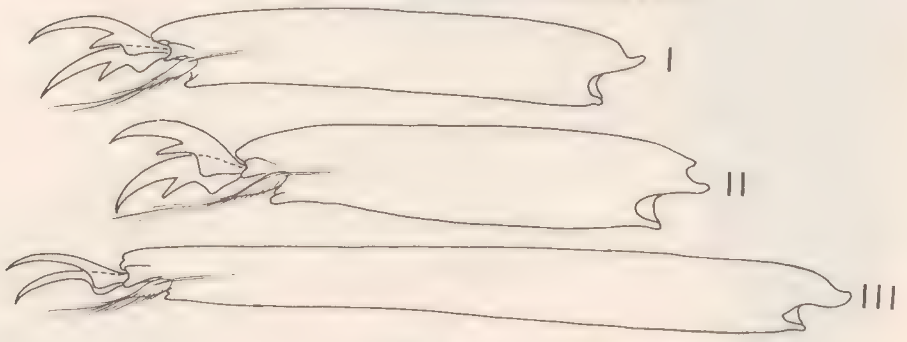
pipkini



parasimilis



pseudomediofasciatus



virilis

0.2

Fig. 62

FEMALE TARSOMERES 5 AND POSTTARSI

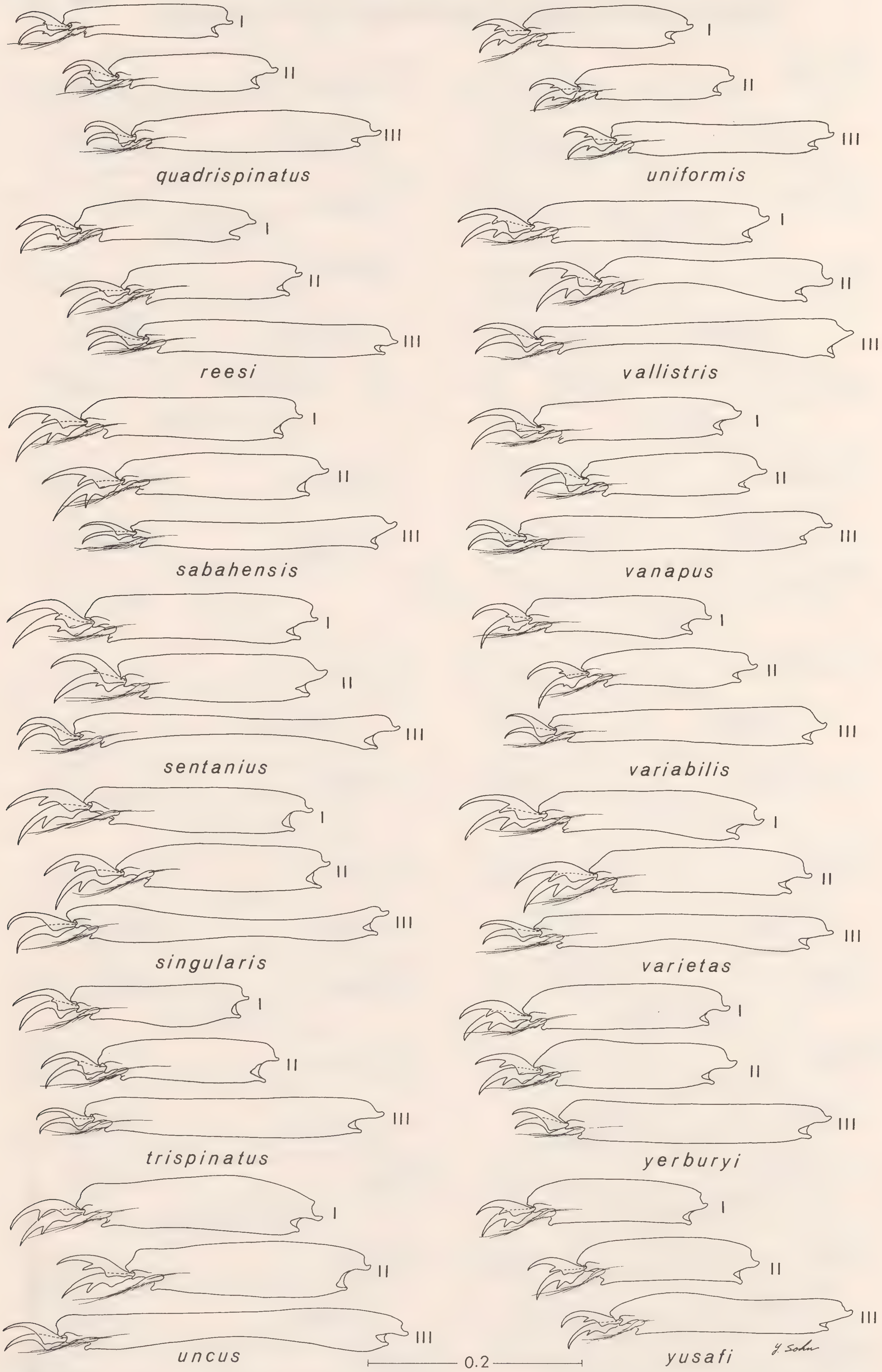
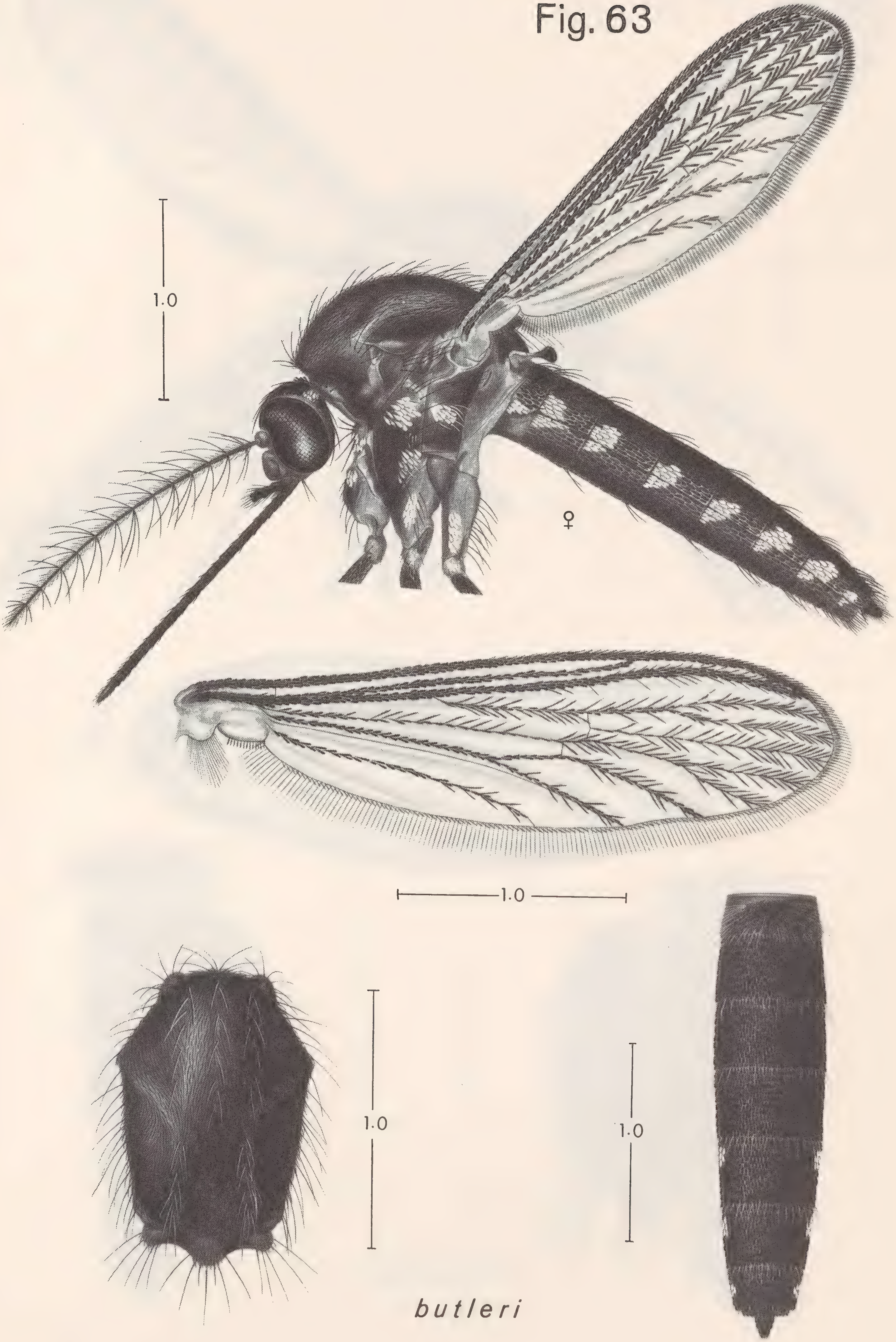
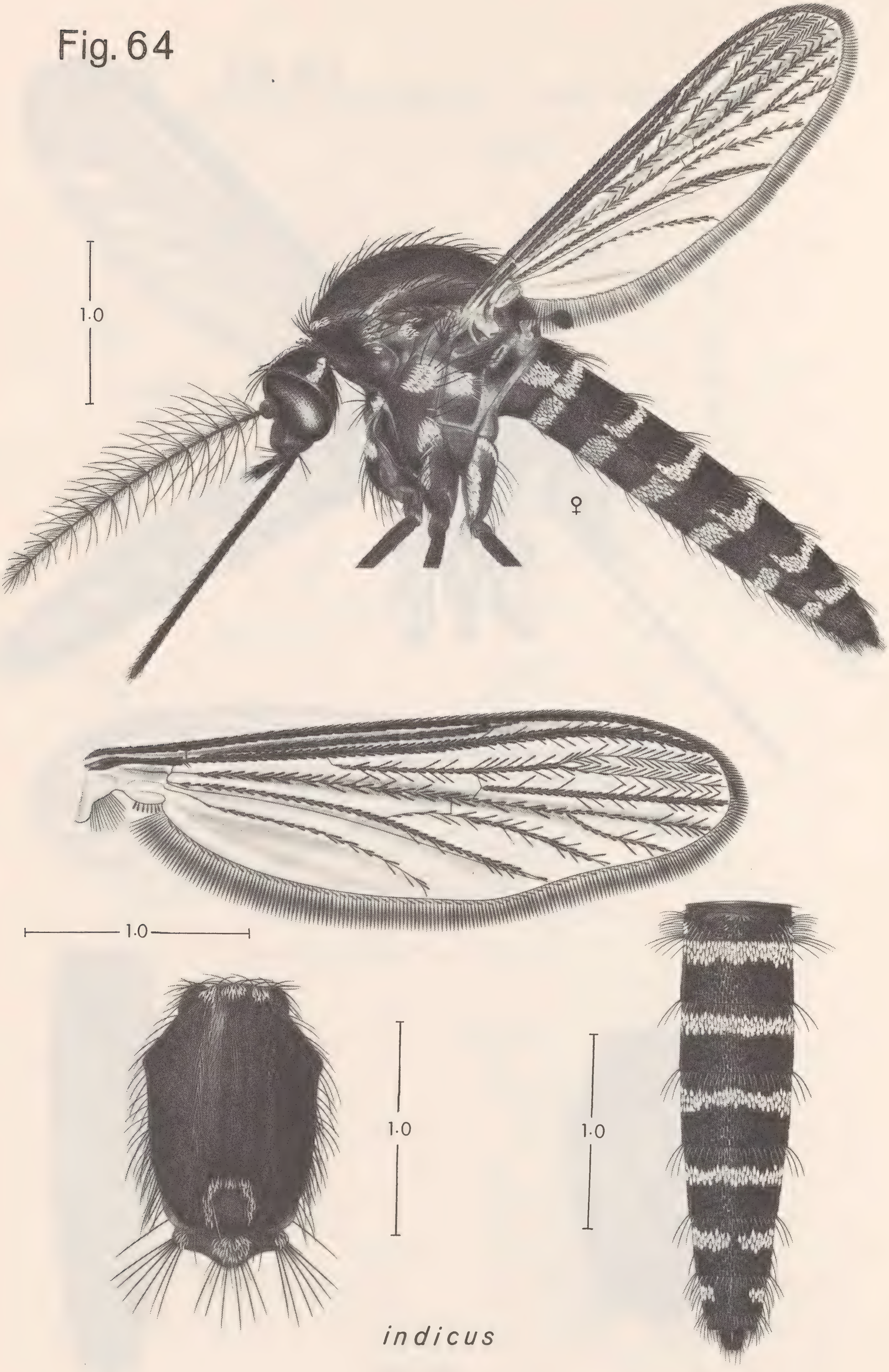


Fig. 63



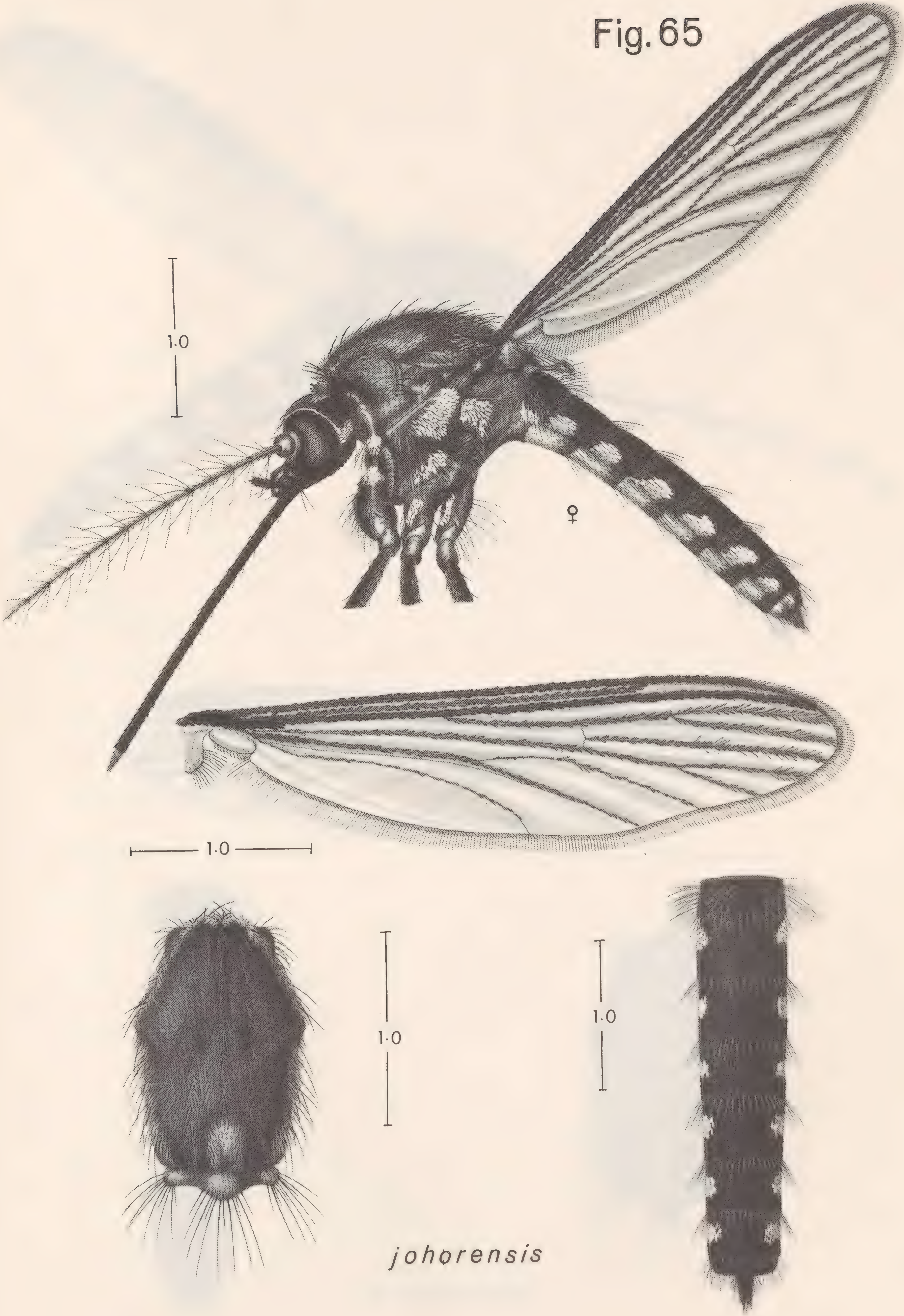
butleri

Fig. 64



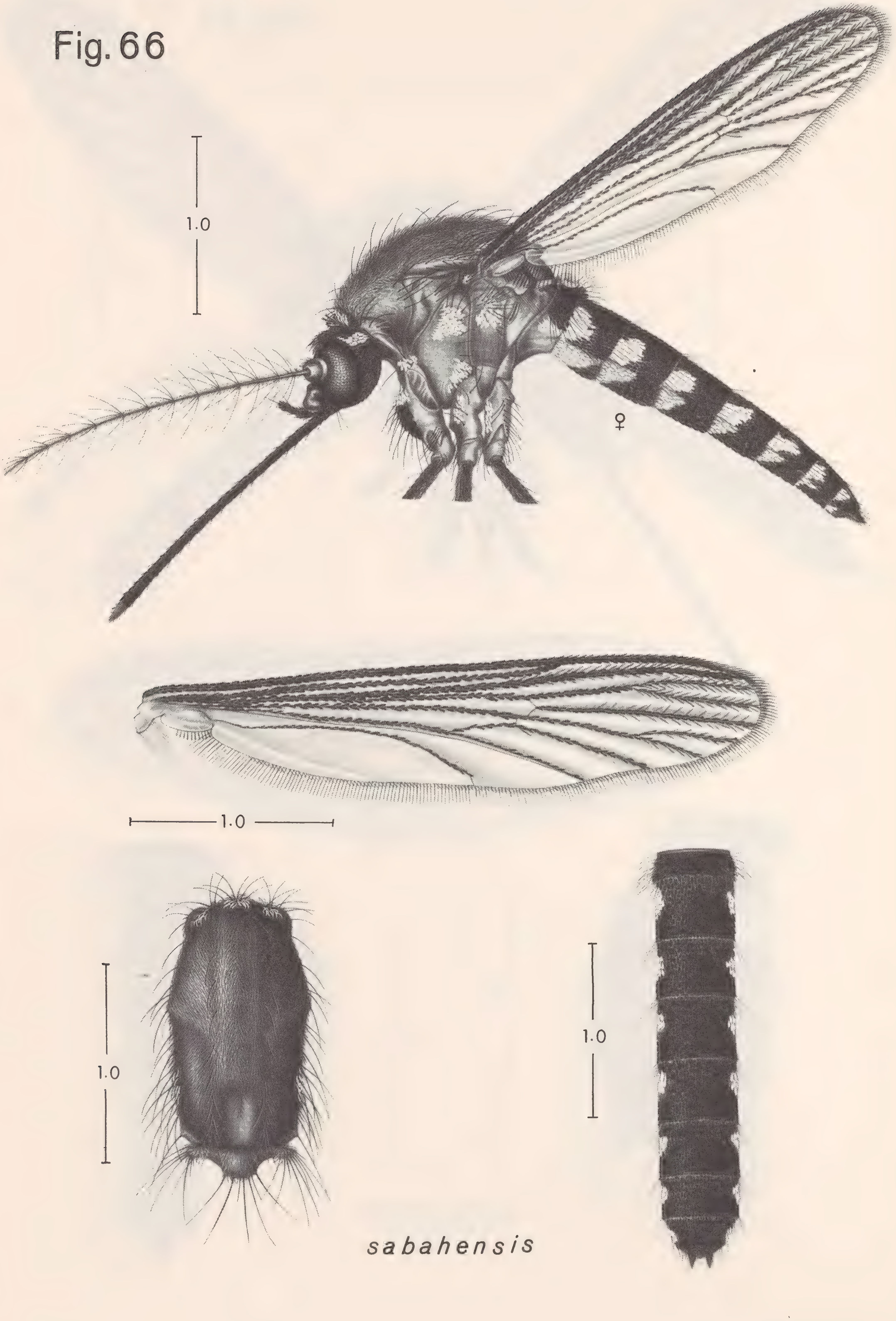
indicus

Fig. 65



johorensis

Fig. 66



sabahensis

APPENDICES

TABLE 1. Current taxonomic status of the subgenus *Verrallina*

Species	♀	♂	♀G	♂G	P	L	E
abditus	*		**				
adustus	**	**		**	**	**	
agrestis	*		**				
andamanensis	**	**	**	**	**	**	
atriisimilis	**	**	**	**		**	
atrius	**	**	**	**	**	**	
azureosquamatus	**		**				
bifoliatus		*		**			
butleri	**	**	**	**	**	**	
campylostylus	**	**	**	**	**	**	
carmenti	**	**	**	**	**	**	**
cautus	*	*	**	**			
clavatus	**	**	**	**	**		
comatus	*		**				
comosus	**		**				
consonensis		*		**	**	**	
cretatus	**	**	**	**	**	**	
cuccioi	**	**	**	**	**	**	
cunninghami	**	*					

---

* = Stage has been described.

** = Portion of stage has been figured. Many of the adult ♀ and ♂ illustrations are of the posttarsi only.

? = Not a positive association.

♀ = Female; ♀G = Female genitalia; ♂ = Male; ♂G = Male genitalia; P = Pupa; L = Larva; E = Egg.

TABLE 1 (Continued).

Species	♀	♂	♀G	♂G	P	L	E
cyrtolabis	**	**	**	**	**	**	
dux	**	**	**	**	**	**	**
embiensis		**		**			
foliformis	**	**	**	**	**	**	
fragilis	**	*	**	**			
funereus	*	*	**	**	*	**	**
gibbosus	*	**	**	**	**	**	
hamistylus	**	**	**	**		**	
harrisonicus	*		**				
hispidus	*		**				
incertus	**	**	**	**	**	**	
indecorabilis	*	**	**	**			
indicus	**	**	**	**	**	**	
iriomotensis	**		**				
johnsoni	**	**	**	**	**	**	
johorensis	**		**				
killertonis	*	**	**	**			
kompongus		**		**			
lankaensis	*	*	**	**			
latipennis	**	*	**	**	**	**	
leicesteri	**	**	**	**	**	**	
leilae		*		**			
lineatus	**	**	**	**	**	**	**
lugubris	**	**	**	**	**		
macrodixoa	**	**	**	**		**	

TABLE 1 (Continued).

Species	♀	♂	♀G	♂G	P	L	E
margarsen	**	**	**	**	**	**	
mccormicki	**	**	**	**	**	**	
milnensis	*	**	**	**			
multifolium	*	**	**	**	**	**	
neomacrodixoa	**	**	**	**	**	**	
nigrotarsis	**	**	**	**	**	**	
nobukonis	**	**	**	**	**	**	**
notabilis	**		**				
nubicolus		*		**			
obsoletus	*	**		**			
pahangi	*		**				
panayensis	**	**	**	**			
parasimilis	**	**?		**?	*	**	**
petroelephantus	*		**				
philippinensis	*	*	**	**			
phnomus	*	**	**	**			
pipkini	**		**				
prioekanensis		**		**			
protuberans		*		**			
pseudodiurnus		*		**			
pseudomediofasciatus	**	**	**	**		**	
pseudovarietas		**		**			
quadrifolium	*	**	**	**	**		
quadrispinatus	**	**	**	**	*	*	
ramalingami		**		**			

TABLE 1 (Continued).

Species	♀	♂	♀G	♂G	P	L	E
rami		**		**			
rarus	**	**	**	**			
reesi	**	**		**			
robertsi	**	**	**	**		**	
sabahensis	**		**				
seculatus		**		**			
sentanius	**	**	**	**	*	**	
similis	*	**?		**?	**	**	
simplus		*		**			
singularis	**	**	**	**			
sohni		**		**			
spermathecus	*		**				
stungus	**		**				
torosus		**		**	**	**	
trispinatus	**	**	**	**	**	**	
uncus	**	**	**	**	**	**	
uniformis	**	*	**	**			
vallistris	**	**	**	**	**	**	
vanapus	**	**		**	**		
variabilis	**	**	**	**	**	**	
varietas	**	*	**	**			
virilis	**	**	**	**			
yerburyi	**	**	**	**			
yusafi	**	**	**	**	**	**	

TABLE 2. Record of the branching of the setae on the pupae of *Aedes (Verrallina) adustus* (7 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Cephalothorax			Abdomen I (Cont.)			Abdomen III (Cont.)	
1	2-4	2	10	1	1	9	1	1
2	2-3	2	11	1	1	10	3-5	3
3	1-3	2		Abdomen II		11	1	1
4	3-4	3	0	1	1	14	1	1
5	2-4	3	1	16-34	26		Abdomen IV	
6	1	1	2	1	1	0	1	1
7	2-4	2	3	1	1	1	3-6	5
8	3-6	3	4	4-8	7	2	1	1
9	1-3	2	5	3-5	4	3	4-6	6
	Metanotal Plate		6	1	1	4	2-4	3
10	6-12	11	7	1-2	2	5	2-4	2
11	1	1	9	1	1	6	1-3	1
12	2-5	4		Abdomen III		7	2-4	3
	Abdomen I		0	1	1	8	1-4	2
1	16-25	21	1	5-12	7	9	1	1
2	1	1	2	1	1	10	2-4	3
3	2-4	2	3	1	1	11	1	1
4	5-8	8	4	1-3	2	14	1	1
5	4-8	6	5	4-5	4		Abdomen V	
6	1-3	1	6	1-3	2	0	1	1
7	2-6	2	7	3-5	3	1	2-4	2
9	1	1	8	3-6	4	2	1	1

TABLE 2 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)		
3	1-4	2	4	3-6	4	5	1-2	1
4	3-8	6	5	1-3	2	6	3-7	4
5	1-3	2	6	1	1	7	1	1
6	1	1	7	1	1	8	1-4	3
7	3-7	5	8	2-4	4	9	1	1
8	2-5	2	9	1	1	10	1	1
9	1	1	10	1	1	11	1	1
10	1	1	11	1-2	1	14	1	1
11	1	1	14	1	1	Abdomen VIII		
14	1	1	Abdomen VII			0	1	1
Abdomen VI			0	1	1	4	2-3	2
0	1	1	1	1-2	1	9	1-4	2
1	2-5	3	2	1	1	14	1	1
2	1	1	3	2-4	3	Paddle		
3	2-4	2	4	1-4	2	1	1	1

TABLE 3. Record of the branching of the setae on the pupae of *Aedes (Verrallina) butleri* (10 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Cephalothorax			Abdomen I (Cont.)			Abdomen III (Cont.)		
1	2-5	3	10	1	1	9	1	1
2	1-2	2	11	1-2	1	10	3-6	4
3	1-3	2	Abdomen II			11	1	1
4	1-5	4	0	1	1	14	1	1
5	4-7	5	1	17-27	20	Abdomen IV		
6	1	1	2	1	1	0	1	1
7	3-7	5	3	1	1	1	4-7	5
8	4-7	4	4	4-8	4	2	1	1
9	2-4	3	5	3-7	6	3	4-8	5
Metanotal Plate			6	1	1	4	2-4	2
10	7-13	7	7	3-6	4	5	1-2	2
11	1	1	9	1	1	6	2-4	3
12	3-5	4	Abdomen III			7	2-4	4
Abdomen I			0	1	1	8	2-4	3
1	14-23	20	1	4-10	8	9	1	1
2	1	1	2	1	1	10	3-5	4
3	3-5	4	3	1	1	11	1	1
4	6-9	6	4	4-6	4	14	1	1
5	4-9	4	5	4-7	4	Abdomen V		
6	1	1	6	2-4	3	0	1	1
7	1-4	3	7	4-8	5	1	3-5	4
9	1-2	1	8	3-6	4	2	1	1

TABLE 3 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)		
3	3-5	4	4	4-8	5	5	2-4	4
4	4-7	6	5	2-4	2	6	4-8	4
5	1-3	2	6	2-4	3	7	1-3	2
6	2-3	2	7	1-3	2	8	2-4	4
7	4-7	6	8	2-5	3	9	1-2	1
8	2-4	3	9	1	1	10	1-3	2
9	1	1	10	1-2	1	11	1-2	1
10	2-4	2	11	1	1	14	1	1
11	1	1	14	1	1	Abdomen VIII		
14	1	1	Abdomen VII			0	1	1
Abdomen VI			0	1	1	4	3-5	4
0	1	1	1	4-6	5	9	1	1
1	4-6	4	2	1	1	14	1	1
2	1	1	3	4-9	6	Paddle		
3	3-6	4	4	3-6	4	1	1	1

TABLE 4. Record of the branching of the setae on the pupae of *Aedes (Verrallina) carmenti* (9 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Cephalothorax			Abdomen I (Cont.)			Abdomen III (Cont.)		
1	2-3	2	10	1	1	9	1	1
2	2-3	2	11	1	1	10	4-5	4
3	1-2	1	Abdomen II			11	1	1
4	3-5	3	0	1	1	14	1	1
5	5-10	6	1	12-16	13	Abdomen IV		
6	1	1	2	1	1	0	1	1
7	2-7	5	3	1	1	1	5-8	5
8	6-10	7	4	5-10	6	2	1	1
9	3-6	3	5	4-6	5	3	5-10	7
Metanotal Plate			6	1	1	4	2-3	2
10	4-10	7	7	3-5	3	5	2-3	3
11	1	1	9	1	1	6	3-4	3
12	4-7	5	Abdomen III			7	2-4	3
Abdomen I			0	1	1	8	2-4	3
1	19-35	22	1	6-11	7	9	1	1
2	1	1	2	1	1	10	4-5	4
3	2-4	4	3	1	1	11	1	1
4	5-9	8	4	3-7	5	14	1	1
5	4-7	4	5	3-6	5	Abdomen V		
6	1-3	2	6	2-5	3	0	1	1
7	2-5	4	7	4-5	5	1	2-6	4
9	1-3	1	8	4-5	4	2	1	1

TABLE 4 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Abdomen V (Cont.)			Abdomen IV (Cont.)			Abdomen VII (Cont.)	
3	3-6	4	4	4-9	6	5	3-5	4
4	4-10	5	5	2-3	2	6	3-6	4
5	2	2	6	2-3	2	7	1-2	1
6	2-4	3	7	1	1	8	4-6	4
7	4-7	6	8	3-4	3	9	2-3	2
8	2-4	3	9	1	1	10	1-3	1
9	1	1	10	1	1	11	1	1
10	1-3	2	11	1	1	14	1	1
11	1	1	14	1	1		Abdomen VIII	
14	1	1		Abdomen VII		0	1	1
	Abdomen VI		0	1	1	4	2-4	3
0	1	1	1	2-5	4	9	3-6	6
1	3-6	4	2	1	1	14	1	1
2	1	1	3	3-6	4		Paddle	
3	3-5	4	4	3-5	4	1	1-2	1

TABLE 5. Record of the branching of the setae on the pupae of *Aedes (Verrallina) clavatus* (10 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Cephalothorax			Abdomen II			Abdomen III (Cont.)		
1	2	2	0	1	1	14	1	1
2	1-3	2	1	20-31	27	Abdomen IV		
3	1-2	2	2	1	1	0	1	1
4	2-4	2	3	1	1	1	4-6	5
5	2-5	3	4	4-8	4	2	1	1
6	1	1	5	2-4	3	3	3-7	6
7	2-3	2	6	1-2	2	4	2	2
8	2-5	4	7	1-5	2	5	2	2
9	2-3	3	9	1	1	6	1-3	2
Metanotal Plate			Abdomen III			7	1-4	2
10	4-10	6	0	1	1	8	1-3	2
11	1	1	1	4-9	5	9	1	1
12	2-6	4	2	1	1	10	2-4	2
Abdomen I			3	1	1	11	1	1
1	21-33	28	4	2-4	3	14	1	1
2	1	1	5	3-6	4	Abdomen V		
3	2-5	2	6	1-3	2	0	1	1
4	4-9	4	7	2-5	2	1	2-5	2
5	3-6	6	8	2-3	2	2	1	1
6	1-2	1	9	1	1	3	1-3	2
7	2-3	2	10	2-4	3	4	3-7	5
9	1	1	11	1	1	5	2	2

TABLE 5 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)		
6	1-3	2	6	1	1	6	2-4	2
7	2-4	2	7	1	1	7	1	1
8	1-3	2	8	2-3	2	8	2-3	2
9	1	1	9	1	1	9	1	1
10	1	1	10	1	1	10	1	1
11	1	1	11	1	1	11	1-2	1
14	1	1	14	1	1	14	1	1
Abdomen VI			Abdomen VII			Abdomen VIII		
0	1	1	0	1	1	0	1	1
1	2-4	2	1	1-2	2	4	2-3	2
2	1	1	2	1	1	9	2-4	3
3	1-2	1	3	2-3	3	14	1	1
4	2-4	4	4	2-3	3	Paddle		
5	1-2	2	5	1-3	2	1	1	1

TABLE 6. Record of the branching of the setae on the pupae of *Aedes (Verrallina) gibbosus* (10 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Cephalothorax			Abdomen I (Cont.)			Abdomen III (Cont.)		
1	1-3	2	10	1	1	9	1	1
2	1-2	1	11	1	1	10	2-4	3
3	1-3	2	Abdomen II			11	1	1
4	2-3	3	0	1	1	14	1	1
5	2-4	3	1	18-36	22	Abdomen IV		
6	1	1	2	1	1	0	1	1
7	2-4	3	3	1-2	1	1	2-4	3
8	2-3	2	4	5-8	5	2	1	1
9	2-3	2	5	2-4	3	3	4-7	6
Metanotal Plate			6	1	1	4	2-3	3
10	5-10	7	7	1-3	2	5	2-3	2
11	1	1	9	1	1	6	1	1
12	2-4	3	Abdomen III			7	1-3	2
Abdomen I			0	1	1	8	1-2	2
1	15-24	20	1	2-6	6	9	1	1
2	1	1	2	1	1	10	2-4	4
3	1-3	2	3	1	1	11	1	1
4	5-8	6	4	3-5	3	14	1	1
5	3-6	4	5	2-4	3	Abdomen V		
6	1	1	6	1-2	1	0	1	1
7	2-4	3	7	3-4	3	1	1-2	1
9	1	1	8	2-4	4	2	1	1

TABLE 6 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)		
3	2-4	2	4	2-5	4	5	1	1
4	4-7	6	5	1-2	2	6	2-4	3
5	2	2	6	1	1	7	1	1
6	1	1	7	1	1	8	2-4	2
7	3-7	5	8	1-4	2	9	1	1
8	1-3	2	9	1	1	10	1	1
9	1	1	10	1	1	11	1	1
10	1	1	11	1	1	14	1	1
11	1	1	14	1	1	Abdomen VIII		
14	1	1	Abdomen VII			0	1	1
Abdomen VI			0	1	1	4	2-3	2
0	1	1	1	1-2	1	9	1	1
1	1-2	2	2	1	1	14	1	1
2	1	1	3	2-6	3	Paddle		
3	2-4	2	4	2-3	2	1	1	1

TABLE 7. Record of the branching of the setae on the pupae of *Aedes (Verrallina) incertus* (10 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Cephalothorax			Abdomen I (Cont.)			Abdomen III (Cont.)	
1	2-4	3	10	1	1	10	3-6	5
2	2-4	2		Abdomen II		11	1	1
3	2-3	2	0	1	1	14	1	1
4	3-9	5	1	4-14	11		Abdomen IV	
5	4-12	10	2	1	1	0	1	1
6	1	1	3	1	1	1	4-10	7
7	3-8	6	4	4-8	6	2	1	1
8	4-11	9	5	2-4	4	3	6-10	6
9	3-6	4	6	1-2	1	4	2-4	2
	Metanotal Plate		7	2-7	5	5	1	1
10	2-4	3	9	1	1	6	2-5	4
11	1	1		Abdomen III		7	2-6	2
12	4-8	5	0	1	1	8	1-5	4
	Abdomen I		1	4-6	5	9	1	1
1	17-37	25	2	1	1	10	4-6	5
2	1	1	3	1	1	11	1	1
3	2-4	3	4	3-8	3	14	1	1
4	4-12	6	5	2-5	4		Abdomen V	
5	2-6	5	6	3-6	4	0	1	1
6	1-2	1	7	3-7	5	1	4-7	5
7	2-6	6	8	2-5	4	2	1	1
9	1	1	9	1	1	3	3-7	3

TABLE 7 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)		
4	4-11	8	5	1	1	6	4-6	5
5	1	1	6	1-3	2	7	2-3	2
6	3-6	4	7	1-2	2	8	2-6	4
7	5-11	5	8	2-5	4	9	1-3	1
8	2-5	4	9	1	1	10	1-2	1
9	1	1	10	1-2	1	11	1-3	1
10	2-4	3	11	1	1	14	1	1
11	1	1	14	1	1	Abdomen VIII		
14	1	1	Abdomen VII			0	1	1
Abdomen VI			0	1	1	4	2-5	5
0	1	1	1	3-6	3	9	1	1
1	4-7	5	2	1	1	14	1	1
2	1	1	3	3-8	5	Paddle		
3	3-6	3	4	3-7	4	1	1-2	1
4	4-12	8	5	2-4	3			

TABLE 8. Record of the branching of the setae on the pupae of *Aedes (Verrallina) indicus* (9 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Cephalothorax			Abdomen I (Cont.)			Abdomen III (Cont.)		
1	2-3	2	10	1	1	9	1	1
2	2-3	2	11	1	1	10	2-3	2
3	1-2	2	Abdomen II			11	1	1
4	2-5	3	0	1	1	14	1	1
5	3-4	3	1	4-7	6	Abdomen IV		
6	1	1	2	1	1	0	1	1
7	3-4	4	3	1	1	1	1-2	2
8	2-5	4	4	3-4	4	2	1	1
9	2-3	2	5	2-4	4	3	3-5	3
Metanotal Plate			6	1	1	4	2-4	2
10	4-5	5	7	3-5	4	5	2-3	2
11	1	1	9	1	1	6	1-2	2
12	2-4	2	Abdomen III			7	2-3	2
Abdomen I			0	1	1	8	2-3	2
1	12-20	12	1	3-4	3	9	1	1
2	1	1	2	1	1	10	2-3	2
3	1-3	3	3	1	1	11	1-2	1
4	6-10	6	4	2-5	4	14	1	1
5	3-5	3	5	3-5	3	Abdomen V		
6	1	1	6	1-2	1	0	1-3	2
7	2-5	3	7	3-4	-	1	1-2	-
9	1	1	8	2-3	2	2	1	1

TABLE 8 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)		
3	1-4	2	4	2-5	4	5	2-3	2
4	3-6	4	5	2-3	2	6	3-5	4
5	2-3	2	6	1-3	2	7	1-2	1
6	1-4	2	7	1-2	1	8	3-4	3
7	2-4	3	8	2-5	3	9	1	1
8	2-3	3	9	1	1	10	1-2	1
9	1	1	10	1	1	11	1-2	1
10	1-3	2	11	1	1	14	1	1
11	1-2	1	14	1	1	Abdomen VIII		
14	1	1	Abdomen VII			0	1	1
Abdomen VI			0	1	1	4	1-3	3
0	1	1	1	2-5	2	9	1-2	2
1	2-4	2	2	1	1	14	1	1
2	1	1	3	2-6	3	Paddle		
3	1-3	3	4	2-3	2	1	1	1

TABLE 9. Record of the branching of the setae on the pupae of *Aedes (Verrallina) latipennis* (5 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Cephalothorax			Abdomen II			Abdomen III (Cont.)		
1	3-4	3	0	1	1	14	1	1
2	3-4	3	1	7-12	11	Abdomen IV		
3	2-3	2	2	1	1	0	1	1
4	4-6	5	3	1	1	1	6-8	6
5	6-9	8	4	5-11	7	2	1	1
6	1	1	5	5-9	6	3	6-8	7
7	4-5	5	6	1-2	2	4	2-4	3
8	4-8	8	7	2-7	2	5	2-3	2
9	3-5	4	9	1	1	6	2-4	4
Metanotal Plate			Abdomen III			7	1-5	4
10	4-6	4	0	1	1	8	2-3	3
11	1	1	1	6-9	6	9	1	1
12	3-5	4	2	1	1	10	3-7	5
Abdomen I			3	1	1	11	1	1
1	10-21	13	4	4-5	4	14	1	1
2	1	1	5	4-8	5	Abdomen V		
3	3-5	4	6	2-5	4	0	1	1
4	7-12	10	7	2-5	4	1	3-6	5
5	3-6	3	8	3-5	5	2	1	1
6	1-2	2	9	1	1	3	3-6	6
7	3-6	5	10	3-10	5	4	6-10	9
9	1-2	1	11	1-2	1	5	2	2

TABLE 9 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)		
6	2-5	4	6	2-4	3	6	3-8	5
7	5-11	8	7	1-3	2	7	1-3	2
8	2-5	3	8	3-5	4	8	3-5	5
9	1	1	9	1	1	9	1-2	1
10	1-3	3	10	1-2	2	10	1-3	2
11	1	1	11	1	1	11	1-4	2
14	1	1	14	1	1	14	1	1
Abdomen VI			Abdomen VII			Abdomen VIII		
0	1	1	0	1	1	0	1	1
1	4-5	4	1	3-6	4	4	3-4	3
2	1	1	2	1	1	9	1	1
3	3-5	5	3	5-7	6	14	1	1
4	5-7	6	4	3-6	4	Paddle		
5	2	2	5	2-4	3	1	1	1

TABLE 10. Record of the branching of the setae on the pupae of *Aedes (Verrallina) leicesteri* (8 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Cephalothorax			Abdomen I (Cont.)			Abdomen III (Cont.)	
1	2	2	10	1	1	9	1	1
2	2-3	2	11	1-2	1	10	4-5	5
3	1-2	1		Abdomen II		11	1	1
4	3-8	5	0	1	1	14	1	1
5	5-10	6	1	3-8	5		Abdomen IV	
6	1-3	2	2	1	1	0	1	1
7	5-6	5	3	1	1	1	4-7	6
8	5-10	7	4	4-9	5	2	1	1
9	3-5	4	5	5-7	6	3	4-10	6
	Metanotal Plate		6	1	1	4	2-5	4
10	4-7	4	7	2-5	3	5	2-3	2
11	1	1	9	1	1	6	2-5	3
12	4-6	5		Abdomen III		7	2-5	4
	Abdomen I		0	1	1	8	3-5	4
1	16-25	22	1	5-9	6	9	1	1
2	1	1	2	1	1	10	3-6	5
3	4-8	6	3	1	1	11	1	1
4	5-11	9	4	3-6	5	14	1	1
5	3-6	5	5	4-7	5		Abdomen V	
6	1-3	2	6	3-6	4	0	1	1
7	3-5	5	7	3-8	6	1	4-10	5
9	1-3	1	8	3-6	5	2	1	1

TABLE 10 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)	
3	3-5	4	4	5-9	6	5	3-6	4
4	6-9	7	5	2	2	6	4-8	5
5	2	2	6	1-4	2	7	1-3	2
6	3-5	4	7	2-3	2	8	2-5	4
7	6-9	8	8	4-5	5	9	1-4	2
8	3-7	4	9	1	1	10	1-4	2
9	1	1	10	1-2	1	11	1-4	2
10	2-4	2	11	1-2	1	14	1	1
11	1	1	14	1	1		Abdomen VIII	
14	1	1		Abdomen VII		0	1	1
	Abdomen VI		0	1	1	4	2-5	4
0	1	1	1	2-5	4	9	1	1
1	4-8	5	2	1	1	14	1	1
2	1	1	3	4-8	6		Paddle	
3	2-4	4	4	4-6	4	1	1-2	1

TABLE 11. Record of the branching of the setae on the pupae of *Aedes (Verrallina) lugubris* (5 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Cephalothorax			Abdomen I (Cont.)			Abdomen III (Cont.)		
1	3-4	3	10	1	1	9	1	1
2	2-4	3	11	1	1	10	3-5	3
3	2-3	2	Abdomen II			11	1	1
4	3-4	3	0	1	1	14	1	1
5	3-6	4	1	18-37	37	Abdomen IV		
6	1	1	2	1	1	0	1	1
7	2-3	3	3	1	1	1	3-9	4
8	3-5	4	4	5-9	6	2	1	1
9	2-3	2	5	3-7	5	3	4-6	5
Metanotal Plate			6	1	1	4	2-3	3
10	5-12	7	7	2-4	3	5	2-3	2
11	1	1	9	1	1	6	1-3	1
12	2-4	3	Abdomen III			7	2-4	3
Abdomen I			0	1	1	8	2	2
1	17-26	18	1	5-8	5	9	1	1
2	1	1	2	1	1	10	3-4	3
3	2-5	4	3	1	1	11	1	1
4	5-7	7	4	4-7	4	14	1	1
5	3-5	5	5	4-9	6	Abdomen V		
6	1	1	6	2-4	2	0	1	1
7	2-4	2	7	3-6	6	1	3-5	3
9	1-2	1	8	2-4	4	2	1	1

TABLE 11 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)		
3	2-4	3	4	4-6	5	5	1-4	2
4	5-7	5	5	2	2	6	2-4	4
5	2	2	6	1-2	1	7	1-2	2
6	2	2	7	1	1	8	3-4	3
7	4-6	4	8	3-5	3	9	1-3	2
8	2-3	2	9	1	1	10	1-2	2
9	1	1	10	1	1	11	1-2	2
10	1	1	11	1	1	14	1-2	1
11	1	1	14	1	1	Abdomen VIII		
14	1	1	Abdomen VII			0	1	1
Abdomen VI			0	1	1	4	2-3	3
0	1	1	1	2-3	3	9	3-6	3
1	3-5	3	2	1	1	14	1	1
2	1	1	3	2-3	3	Paddle		
3	2-3	3	4	2-3	3	1	1-2	1

TABLE 12. Record of the branching of the setae on the pupae of *Aedes (Verrallina) torosus* (2 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Cephalothorax			Abdomen II			Abdomen III (Cont.)	
1	3	3	0	1	1	14	1	1
2	2-3	2	1	6-8	7		Abdomen IV	
3	2	2	2	1	1	0	1	1
4	4-5	4	3	1	1	1	4-6	6
5	10-11	10	4	6-8	8	2	1	1
6	1-2	1	5	3-6	6	3	5-9	-
7	4-5	5	6	1-2	2	4	2-4	2
8	5-8	7	7	2-3	2	5	2	2
9	4-5	5	9	1	1	6	2-3	2
	Metanotal Plate			Abdomen III		7	2-4	3
10	4-5	4	0	1-2	2	8	3-5	3
11	1	1	1	7	7	9	1	1
12	3-4	4	2	1	1	10	3-6	3
	Abdomen I		3	1	1	11	1	1
1	15-21	-	4	3-4	3	14	1	1
2	1	1	5	4-5	5		Abdomen V	
3	4-5	5	6	2	2	0	1	1
4	6-7	7	7	4	4	1	5-6	5
5	4-5	4	8	3-5	5	2	1	1
6	2	2	9	1	1	3	4	4
7	3-5	3	10	3-5	5	4	4-9	-
9	2	2	11	1	1	5	2	2

TABLE 12 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)		
6	1-3	1	6	1	1	6	2-5	5
7	5-8	5	7	1-2	2	7	1	1
8	5	5	8	4	4	8	2-3	2
9	1	1	9	1	1	9	1-3	1
10	2-3	2	10	1	1	10	2	2
11	1	1	11	1	1	11	1-3	1
14	1	1	14	1	1	14	1	1
Abdomen VI			Abdomen VII			Abdomen VIII		
0	1	1	0	1	1	0	1	1
1	4-6	6	1	3-4	4	4	4-5	4
2	1	1	2	1	1	9	1	1
3	1-3	3	3	4-8	-	14	1	1
4	5-8	5	4	2-4	2	Paddle		
5	2	2	5	1-3	3	1	1	1

TABLE 13. Record of the branching of the setae on the pupae of *Aedes (Verrallina) vallistris* (2 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Cephalothorax			Abdomen I (Cont.)			Abdomen III (Cont.)		
1	2-3	2	10	1	1	9	1	1
2	2-3	-	11	1	1	10	3-4	-
3	2	2	Abdomen II			11	1	1
4	2-3	3	0	1	1	14	1	1
5	3-5	5	1	13-20	13	Abdomen IV		
6	1	1	2	1	1	0	1	1
7	2-4	2	3	1	1	1	4-5	4
8	3-7	4	4	5-6	-	2	1	1
9	2-3	2	5	4	4	3	3-6	3
Metanotal Plate			6	1	1	4	2	2
10	4-5	-	7	1-3	1	5	2-3	2
11	1	1	9	1	1	6	2-3	2
12	1-4	4	Abdomen III			7	1	1
Abdomen I			0	1	1	8	2	2
1	11-17	-	1	6-8	6	9	1	1
2	1	1	2	1	1	10	3-5	3
3	3-4	3	3	1	1	11	1	1
4	5-7	-	4	1-2	-	14	1	1
5	2-4	2	5	4	4	Abdomen V		
6	1	1	6	2	2	0	1	1
7	2-3	2	7	2-4	2	1	3	3
9	1	1	8	2-3	3	2	1	1

TABLE 13 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)		
3	2-4	3	4	4-7	4	5	2	2
4	4-5	-	5	2	2	6	2-5	2
5	2	2	6	1	1	7	1	1
6	2	2	7	1	1	8	2-4	2
7	3-5	4	8	3	3	9	1	1
8	2-3	-	9	1	1	10	1	1
9	1	1	10	1	1	11	1	1
10	1	1	11	1	1	14	1	1
11	1	1	14	1	1	Abdomen VIII		
14	1	1	Abdomen VII			0	1	1
Abdomen VI			0	1	1	4	1-2	2
0	1	1	1	2	2	9	2-3	2
1	2-3	2	2	1	1	14	1	1
2	1	1	3	3	3	Paddle		
3	1-2	-	4	2	2	1	1	1

TABLE 14. Record of the branching of the setae on the pupae of *Aedes (Verrallina) yusafi* (9 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Cephalothorax			Abdomen II			Abdomen III (Cont.)		
1	1-3	2	0	1	1	14	1	1
2	1-2	2	1	8-13	8	Abdomen IV		
3	1-3	2	2	1	1	0	1	1
4	2-5	3	3	1	1	1	3-5	4
5	3-5	4	4	2-5	3	2	1	1
6	1-2	1	5	3-5	3	3	2-5	4
7	2-3	2	6	1-2	2	4	2-3	2
8	2-4	4	7	2-3	2	5	2-3	3
9	2-3	3	9	1	1	6	1-3	2
Metanotal Plate			Abdomen III			7	1-2	2
10	2-5	3	0	1	1	8	1-2	2
11	1	1	1	3-5	4	9	1	1
12	2-4	3	2	1	1	10	1-3	2
Abdomen I			3	1	1	11	1	1
1	10-20	16	4	2-5	3	14	1	1
2	1-2	1	5	2-4	3	Abdomen V		
3	2-4	3	6	2-3	2	0	1	1
4	3-5	4	7	1-4	2	1	2-4	3
5	2-4	2	8	1-3	2	2	1	1
6	2-3	2	9	1	1	3	2-3	2
7	2-3	3	10	1-3	2	4	3-5	4
9	1	1	11	1	1	5	1-2	2

TABLE 14 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)		
6	1-2	2	6	1-2	1	6	2-4	3
7	1-4	2	7	1	1	7	1	1
8	2-3	2	8	1-3	2	8	1-3	2
9	1	1	9	1	1	9	1	1
10	1	1	10	1	1	10	1	1
11	1	1	11	1	1	11	1	1
14	1	1	14	1	1	14	1	1
Abdomen VI			Abdomen VII			Abdomen VIII		
0	1	1	0	1	1	0	1	1
1	2-4	3	1	2-4	2	4	2-4	2
2	1	1	2	1	1	9	1-2	1
3	2-4	2	3	2-4	3	14	1	1
4	2-5	4	4	2-3	2	Paddle		
5	1-3	2	5	2	2	1	1	1

TABLE 15. Record of the branching of the setae on the larvae of *Aedes (Verrallina) adustus* (10 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Antenna			Prothorax (Cont.)			Mesothorax (Cont.)	
1	4-6	5	2	1-2	2	10	1	1
	Head		3	1-4	3	11	1-3	1
0	1	1	4	2-4	3	12	1	1
1	1	1	5	1	1	13	14-31	18
3	1	1	6	1	1	14	13-19	16
4	5-8	6	7	2-3	2		Metathorax	
5	6-10	8	8	1-3	1	1	4-9	4
6	4-7	6	9	1-2	2	2	3-6	4
7	10-14	11	10	1	1	3	12-20	15
8	2-3	2	11	3-5	4	4	4-7	4
9	2-6	4	12	1	1	5	1-2	1
10	2-4	4	14	2-3	2	6	1-3	2
11	5-8	5		Mesothorax		7	6-10	8
12	4-9	4	1	2-5	5	8	13-23	15
13	2-4	3	2	2-5	4	9	2-3	2
14	1	1	3	1	1	10	1	1
15	3-6	5	4	2-6	4	11	1-3	1
18	1	1	5	1-2	1	12	1	1
6MP	1	1	6	6-7	6	13	10-22	15
	Prothorax		7	1	1		Abdomen I	
0	12-28	17	8	5-8	7	1	1-3	-
1	1	1	9	6-8	8	2	1	1

TABLE 15 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Abdomen I (Cont.)			Abdomen II (Cont.)			Abdomen IV (Cont.)	
3	4-8	5	12	2-4	3	2	1	1
4	15-23	18	13	12-28	15	3	2-4	3
5	4-8	5	14	1	1	4	2-3	2
6	2-3	2		Abdomen III		5	1-3	2
7	1-2	1	0	1	1	6	1	1
9	3-5	4	1	5-10	8	7	6-14	12
10	1-4	2	2	1-2	1	8	1-3	1
11	1-2	2	3	2-3	3	9	1	1
13	1-2	1	4	2-3	3	10	2-3	2
	Abdomen II		5	2-4	3	11	2-4	2
0	1	1	6	1	1	12	2-3	2
1	4-5	5	7	5-12	9	13	2-4	2
2	1	1	8	1-2	1	14	1	1
3	2-5	5	9	1	1		Abdomen V	
4	11-16	14	10	2	2	0	1	1
5	3-6	4	11	2-3	3	1	4-7	5
6	2-3	2	12	2-4	2	2	1	1
7	4-6	5	13	4-6	4	3	2-3	3
8	2-4	2	14	1	1	4	7-11	-
9	1	1		Abdomen IV		5	1-3	2
10	1-2	1	0	1	1	6	1	1
11	2-4	2	1	5-9	6	7	4-11	9

TABLE 15 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)	
8	1-3	1	11	2-3	2	14	1	1
9	1	1	12	2-4	2		Abdomen VIII	
10	1-2	1	13	14-23	19	0	1	1
11	2-4	2	14	1	1	1	4-6	5
12	1-3	1		Abdomen VII		2	2-3	2
13	3-6	3	0	1	1	3	5-11	6
14	1	1	1	4-6	5	4	1-2	2
	Abdomen VI		2	1	1	5	5-8	7
0	1	1	3	5-7	7	14	1	1
1	4-8	6	4	2-3	3		Abdomen X	
2	1	1	5	3-8	5	1	1-2	1
3	2-3	2	6	9-12	10	2	6-12	9
4	4-7	5	7	2-4	2	3	1	1
5	2-5	3	8	8-13	9		Siphon	
6	1	1	9	2-3	2	1	3-5	3
7	5-6	6	10	2-4	3	2	1	1
8	4-7	6	11	2-3	3	6	1	1
9	1	1	12	2-3	2	7	1	1
10	1-2	1	13	7-14	12	8	3-5	4
						9	1	1

TABLE 16. Record of the branching of the setae on the larvae of *Aedes (Verrallina) butleri* (10 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Antenna			Prothorax (Cont.)			Mesothorax (Cont.)	
1	6-9	7	2	2-3	3	10	1	1
	Head		3	2-4	3	11	1-2	2
0	1	1	4	3-5	4	12	1	1
1	1	1	5	1	1	13	7-17	10
3	1	1	6	1	1	14	5-10	8
4	3-6	4	7	1-3	2		Metathorax	
5	2-4	3	8	1	1	1	2-5	2
6	3-4	3	9	1-2	2	2	4-8	5
7	5-7	6	10	1	1	3	6-10	9
8	3-5	4	11	2-6	4	4	4-6	5
9	3-5	4	12	1	1	5	1	1
10	3-5	4	14	2-3	2	6	3-4	3
11	2-5	2		Mesothorax		7	4-8	8
12	4-5	4	1	2-4	4	8	7-12	9
13	2-4	3	2	2-5	3	9	2	2
14	1	1	3	3	3	10	1	1
15	5-7	5	4	4-7	6	11	2-3	3
18	1	1	5	1	1	12	1	1
6MP	1	1	6	3-7	5	13	6-9	6
	Prothorax		7	1	1		Abdomen I	
0	9-15	9	8	4-8	7	1	1-3	2
1	1	1	9	6-8	7	2	1	1

TABLE 16 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Abdomen I (Cont.)			Abdomen II (Cont.)			Abdomen IV (Cont.)	
3	4-7	5	12	3-5	3	2	1	1
4	9-18	9	13	7-12	8	3	4-6	6
5	3-4	4	14	1	1	4	2-4	2
6	2-3	2		Abdomen III		5	1-3	2
7	1	1	0	1	1	6	1	1
9	3-5	4	1	4-7	6	7	6-11	6
10	3-4	4	2	1	1	8	1	1
11	1-2	2	3	4-6	4	9	1	1
13	1-2	2	4	2-5	3	10	3-4	3
	Abdomen II		5	1-3	2	11	2	2
0	1	1	6	1	1	12	2-3	2
1	1-3	1	7	5-8	6	13	2-4	4
2	1	1	8	1	1	14	1	1
3	4-9	5	9	1	1		Abdomen V	
4	6-12	8	10	2-4	3	0	1	1
5	2-4	3	11	2-3	2	1	4-6	5
6	1-2	2	12	2-3	2	2	1	1
7	4-6	6	13	3-5	4	3	4-8	4
8	2	2	14	1	1	4	7-10	8
9	1	1		Abdomen IV		5	1-3	2
10	1-2	2	0	1	1	6	1	1
11	2	2	1	4-6	4	7	6-10	7

TABLE 16 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)		
8	1-2	1	11	2-3	2	14	1	1
9	1	1	12	2-5	4	Abdomen VIII		
10	1-2	2	13	13-20	20	0	1	1
11	2-3	2	14	1	1	1	3-5	3
12	1-3	2	Abdomen VII			2	3-5	4
13	3-5	3	0	1	1	3	5-11	7
14	1	1	1	4-7	5	4	1	1
Abdomen VI			2	1	1	5	9-15	10
0	1	1	3	5-7	7	14	1	1
1	4-7	6	4	4-6	5	Abdomen X		
2	1	1	5	3-6	4	1	1	1
3	4-6	4	6	7-11	10	2	6-8	7
4	4-8	8	7	2-3	2	3	1	1
5	1-4	2	8	3-7	5	Siphon		
6	1	1	9	1-2	2	1	4-7	5
7	4-5	4	10	3-5	4	2	1	1
8	3-5	3	11	1-3	2	6	1	1
9	1	1	12	4-6	5	7	1	1
10	1-4	2	13	6-10	9	8	3-6	5
						9	1	1

TABLE 17. Record of the branching of the setae on the larvae of *Aedes (Verrallina) carmenti* (10 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Antenna			Prothorax (Cont.)			Mesothorax (Cont.)	
1	3-5	4	2	2-3	2	10	1	1
	Head		3	2	2	11	2-3	3
0	1	1	4	3-6	5	12	1	1
1	1	1	5	1	1	13	18-40	24
3	1	1	6	1	1	14	13-20	15
4	6-10	7	7	2	2		Metathorax	
5	3-7	5	8	1-2	1	1	4-7	5
6	3	3	9	1	1	2	6-9	7
7	8-14	11	10	1	1	3	10-16	10
8	1	1	11	3-6	5	4	6-9	7
9	2-4	3	12	1	1	5	1	1
10	2-4	3	14	1-2	2	6	2-3	3
11	5-8	6		Mesothorax		7	6-10	7
12	3-6	5	1	4-8	6	8	18-27	22
13	1	1	2	3-7	4	9	3	3
14	1	1	3	2-4	3	10	1	1
15	5-11	5	4	6-9	7	11	2-3	3
18	1	1	5	1	1	12	1	1
6MP	1	1	6	5-10	6	13	14-23	15
	Prothorax		7	1	1		Abdomen I	
0	14-25	18	8	6-8	8	1	1	1
1	1	1	9	6-11	10	2	1	1

TABLE 17 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Abdomen I (Cont.)			Abdomen II (Cont.)			Abdomen IV (Cont.)	
3	5-11	6	12	3-5	4	2	1	1
4	17-27	24	13	12-24	15	3	4-8	7
5	5-9	6	14	1	1	4	2-5	3
6	3	3		Abdomen III		5	1-2	1
7	1	1	0	1	1	6	1	1
9	3-5	3	1	6-11	8	7	8-13	10
10	2-4	3	2	1	1	8	1	1
11	3-5	3	3	5-9	6	9	1	1
13	1-2	1	4	2-5	3	10	2-3	3
	Abdomen II		5	1-3	2	11	2-3	3
0	1	1	6	1	1	12	2-4	3
1	3-6	4	7	7-12	10	13	2-4	3
2	1	1	8	1	1	14	1	1
3	5-9	7	9	1	1		Abdomen V	
4	10-17	11	10	2-3	2	0	1	1
5	2-6	4	11	2-3	3	1	5-9	7
6	2-3	2	12	2-4	3	2	1	1
7	3-8	5	13	3-7	4	3	2-4	3
8	2-4	3	14	1-2	1	4	6-12	7
9	1-4	1		Abdomen IV		5	1-2	1
10	2-3	2	0	1	1	6	1	1
11	2-4	3	1	5-10	8	7	8-15	12

TABLE 17 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)	
8	1	1	11	2-4	3	14	1-3	1
9	1	1	12	2-3	2		Abdomen VIII	
10	1	1	13	22-40	30	0	1	1
11	2-4	3	14	1	1	1	5-8	6
12	1-2	1		Abdomen VII		2	2	2
13	2-4	3	0	1	1	3	6-11	8
14	1-2	1	1	4-6	4	4	1	1
	Abdomen VI		2	1	1	5	7-11	9
0	1	1	3	5-9	6	14	1	1
1	3-6	4	4	2-4	3		Abdomen X	
2	1	1	5	4-8	6	1	1	1
3	3-5	4	6	10-16	11	2	3	3
4	3-7	6	7	1	1	3	1	1
5	2-4	2	8	6-9	7		Siphon	
6	1	1	9	2-4	4	1	2-4	3
7	4-7	5	10	2-3	2	2	1	1
8	5-8	5	11	2-4	2	6	1	1
9	1-2	1	12	2-3	3	7	1	1
10	1	1	13	6-11	7	8	2-5	2
						9	1	1

TABLE 18. Record of the branching of the setae on the larvae of *Aedes (Verrallina) cyrtolabis* (6 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Antenna			Prothorax (Cont.)			Mesothorax (Cont.)	
1	4-6	6	2	2-4	3	10	1	1
	Head		3	3-5	3	11	1-2	1
0	1	1	4	3-5	4	12	1	1
1	1	1	5	1	1	13	17-21	17
3	1	1	6	1	1	14	6-7	6
4	4-8	6	7	2	2		Metathorax	
5	2-5	3	8	1	1	1	3-5	4
6	2-3	3	9	2-5	3	2	5-9	8
7	7-14	11	10	1-2	1	3	10-19	-
8	3-6	4	11	4-6	4	4	5-7	-
9	4-7	5	12	1-2	1	5	1	1
10	3-7	5	14	2-3	2	6	3-5	3
11	5-8	6		Mesothorax		7	6-9	7
12	4-8	6	1	5-8	8	8	10-23	-
13	3-6	4	2	2-6	6	9	3	3
14	1	1	3	1-2	1	10	1	1
15	6-10	6	4	5-11	11	11	2	2
18	1	1	5	1	1	12	1-3	1
6MP	1	1	6	5-8	6	13	13-14	14
	Prothorax		7	1	1		Abdomen I	
0	11-17	14	8	6-9	7	1	1	1
1	2-3	2	9	6-10	10	2	1	1

TABLE 18 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen I (Cont.)			Abdomen II (Cont.)			Abdomen IV (Cont.)		
3	6-11	11	12	4-5	5	2	1	1
4	13-26	13	13	12-23	12	3	7-9	7
5	3-7	5	14	1	1	4	2-5	4
6	2	2	Abdomen III			5	2-3	3
7	1	1	0	1	1	6	1	1
9	5-7	5	1	10-12	10	7	10-12	10
10	4-8	5	2	1	1	8	1	1
11	3-5	3	3	5-13	-	9	1	1
13	1-2	2	4	2-4	4	10	4-5	4
Abdomen II			5	3-5	3	11	2-4	4
0	1	1	6	1	1	12	4-5	4
1	1	1	7	9-17	13	13	6-8	8
2	1	1	8	1	1	14	1	1
3	5-10	-	9	1	1	Abdomen V		
4	12-18	-	10	4-6	4	0	1	1
5	3-7	3	11	4-5	4	1	6	6
6	2	2	12	3-5	4	2	1	1
7	3-10	7	13	7-8	7	3	5-6	6
8	2-3	2	14	1	1	4	8	8
9	1	1	Abdomen IV			5	1	1
10	2-4	4	0	1	1	6	1	1
11	4-6	5	1	9-12	10	7	11-17	-

TABLE 18 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)		
8	1	1	11	2-4	4	14	1	1
9	1	1	12	3-5	5	Abdomen VIII		
10	1-2	2	13	27-48	45	0	1	1
11	3-4	3	14	1-2	2	1	6-9	7
12	2-4	3	Abdomen VII			2	2-5	5
13	6-10	8	0	1	1	3	7-11	11
14	1	1	1	7-13	9	4	2-4	2
Abdomen VI			2	1	1	5	8-13	11
0	1	1	3	6-12	10	14	1	1
1	5-8	-	4	4-5	5	Abdomen X		
2	1	1	5	4-6	5	1	1	1
3	5-10	5	6	13-17	17	2	6-8	7
4	6-9	7	7	3	3	3	1	1
5	3-5	3	8	5-14	8	Siphon		
6	1	1	9	2-4	2	1	5-8	8
7	4-6	4	10	4-6	5	2	1	1
8	7-9	7	11	3-5	-	6	1	1
9	1	1	12	5-10	-	7	1	1
10	2-3	2	13	10-13	10	8	5-8	7
						9	1	1

TABLE 19. Record of the branching of the setae on the larvae of *Aedes (Verrallina) gibbosus* (10 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Antenna			Prothorax (Cont.)			Mesothorax (Cont.)	
1	3-5	3	2	2	2	10	1	1
	Head		3	2-4	3	11	1	1
0	1	1	4	3-5	3	12	1	1
1	1	1	5	1	1	13	18-26	18
3	1	1	6	1	1	14	7-11	11
4	5-10	6	7	2-3	2		Metathorax	
5	3-6	4	8	1	1	1	4-7	5
6	3-5	3	9	2-3	2	2	4-8	6
7	9-15	9	10	1	1	3	9-19	13
8	2-4	3	11	4-7	5	4	5-11	7
9	4-6	5	12	1	1	5	1-2	1
10	3-5	4	14	2-3	2	6	3-4	3
11	4-8	5		Mesothorax		7	5-9	7
12	6-8	6	1	3-6	5	8	13-22	20
13	2-4	4	2	3-6	4	9	2-3	3
14	1-2	1	3	1	1	10	1	1
15	5-8	6	4	5-9	7	11	3	3
18	1	1	5	1	1	12	1	1
6MP	1-2	1	6	5-8	5	13	10-16	12
	Prothorax		7	1	1		Abdomen I	
0	14-23	18	8	6-11	8	1	1-2	1
1	1	1	9	7-11	7	2	1	1

TABLE 19 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen I (Cont.)			Abdomen II (Cont.)			Abdomen IV (Cont.)		
3	5-9	8	12	2-5	4	2	1	1
4	14-25	22	13	10-21	10	3	3-6	5
5	4-8	5	14	1	1	4	3-4	3
6	2	2	Abdomen III			5	1-4	3
7	1	1	0	1	1	6	1	1
9	3-7	5	1	6-13	9	7	7-15	11
10	3-5	3	2	1	1	8	1	1
11	2-4	3	3	3-6	5	9	1	1
13	1	1	4	2-6	3	10	2-4	3
Abdomen II			5	2-4	4	11	2-3	2
0	1	1	6	1	1	12	2-3	3
1	1-2	1	7	7-12	10	13	4-7	5
2	1	1	8	1	1	14	1	1
3	4-7	6	9	1	1	Abdomen V		
4	10-18	13	10	2-5	3	0	1	1
5	3-6	4	11	1-3	2	1	5-10	8
6	2	2	12	2-4	3	2	1	1
7	4-12	6	13	5-8	8	3	3-5	4
8	2-3	2	14	1	1	4	7-12	10
9	1-2	1	Abdomen IV			5	1-3	2
10	1-2	2	0	1	1	6	1	1
11	2-3	2	1	7-10	8	7	9-17	11

TABLE 19 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)		
8	1	1	11	2-5	3	14	1	1
9	1	1	12	3-5	3	Abdomen VIII		
10	2	2	13	19-30	30	0	1	1
11	1-3	2	14	1	1	1	5-10	7
12	2-4	2	Abdomen VII			2	2-4	3
13	3-6	4	0	1	1	3	6-11	7
14	1	1	1	5-10	6	4	2-3	2
Abdomen VI			2	1	1	5	6-11	8
0	1	1	3	5-12	9	14	1	1
1	6-8	6	4	3-7	5	Abdomen X		
2	1	1	5	5-10	6	1	1-3	2
3	4-7	5	6	10-17	12	2	6-10	8
4	5-7	6	7	2-3	3	3	1	1
5	3-6	4	8	7-11	8	Siphon		
6	1	1	9	3-4	3	1	2-4	3
7	4-7	6	10	2-5	4	2	1	1
8	4-7	4	11	2-4	2	6	1	1
9	1	1	12	3-6	5	7	1	1
10	1-2	2	13	6-12	8	8	2-3	3
						9	1	1

TABLE 20. Record of the branching of the setae on the larvae of *Aedes (Verrallina) incertus* (10 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Antenna			Prothorax (Cont.)			Mesothorax (Cont.)	
1	4-6	5	2	2-3	2	10	1	1
	Head		3	3-5	3	11	2-3	-
0	1	1	4	4-9	5	12	1	1
1	1	1	5	1	1	13	16-29	17
3	1	1	6	1	1	14	11-16	11
4	5-8	6	7	1-2	2		Metathorax	
5	2-4	3	8	1	1	1	3-5	4
6	2-3	2	9	2-3	2	2	4-9	6
7	8-12	11	10	1	1	3	13-21	16
8	3-4	4	11	5-6	5	4	5-9	7
9	5-9	8	12	1	1	5	1	1
10	4-8	4	14	2-3	2	6	2-3	3
11	4-7	5		Mesothorax		7	6-7	7
12	6-9	8	1	3-6	4	8	14-21	16
13	3-6	4	2	3-6	4	9	2-3	3
14	1	1	3	1	1	10	1	1
15	5-7	7	4	6-10	7	11	3-4	3
18	1	1	5	1	1	12	1	1
6MP	1	1	6	5-8	7	13	13-19	16
	Prothorax		7	1	1		Abdomen I	
0	14-22	16	8	5-9	6	1	1-2	1
1	1	1	9	8-10	8	2	1	1

TABLE 20 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen I (Cont.)			Abdomen II (Cont.)			Abdomen IV (Cont.)		
3	7-11	7	12	2-6	5	2	1	1
4	17-25	20	13	14-23	15	3	4-8	5
5	5-8	5	14	1	1	4	2-4	3
6	2	2	Abdomen III			5	1-3	2
7	1	1	0	1	1	6	1	1
9	4-6	5	1	6-11	8	7	8-17	10
10	3-6	5	2	1	1	8	1-2	1
11	2-4	3	3	4-9	5	9	1	1
13	1-3	1	4	3-4	4	10	2-6	3
Abdomen II			5	2-4	2	11	2-3	2
0	1	1	6	1	1	12	2-4	3
1	1-2	1	7	6-15	11	13	7-11	9
2	1	1	8	1	1	14	1	1
3	5-7	7	9	1	1	Abdomen V		
4	10-16	10	10	2-5	3	0	1	1
5	2-5	3	11	2-4	2	1	7-13	9
6	2	2	12	2-4	2	2	1	1
7	5-10	7	13	6-9	8	3	3-7	5
8	2-3	2	14	1	1	4	8-15	11
9	1	1	Abdomen IV			5	1-2	1
10	2-3	2	0	1	1	6	1	1
11	2-5	4	1	8-15	8	7	7-14	12

TABLE 20 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)	
8	1-2	1	11	2-4	3	14	1	1
9	1	1	12	3-6	4		Abdomen VIII	
10	2-3	3	13	27-35	27	0	1	1
11	2-3	2	14	1	1	1	5-9	7
12	2-3	2		Abdomen VII		2	2-4	3
13	6-13	7	0	1	1	3	5-10	7
14	1	1	1	6-9	7	4	2	2
	Abdomen VI		2	1	1	5	7-12	9
0	1	1	3	5-12	9	14	1	1
1	5-8	-	4	4-6	4		Abdomen X	
2	1	1	5	5-9	6	1	2	2
3	3-7	4	6	11-18	12	2	6-10	9
4	6-10	-	7	3-5	4	3	1	1
5	2-3	3	8	6-11	6		Siphon	
6	1	1	9	2-4	2	1	3-5	4
7	5-7	6	10	3-5	4	2	1	1
8	5-6	5	11	2-3	2	6	1	1
9	1	1	12	3-6	4	7	1	1
10	2-3	2	13	6-10	10	8	2-4	4
						9	1	1

TABLE 21. Record of the branching of the setae on the larvae of *Aedes (Verrallina) indicus* (10 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Antenna			Prothorax (Cont.)			Mesothorax (Cont.)	
1	2-3	2	2	2-3	3	10	1	1
	Head		3	2-4	4	11	2-3	2
0	1	1	4	4-7	5	12	1	1
1	1	1	5	1	1	13	14-18	18
3	1	1	6	1	1	14	7-10	7
4	2-5	3	7	2	2		Metathorax	
5	3	3	8	2	2	1	2-5	2
6	2-4	3	9	2-5	2	2	3-8	5
7	7-12	8	10	1	1	3	3-12	11
8	2-4	4	11	2-5	5	4	3-6	6
9	3-4	4	12	1	1	5	1	1
10	2-5	4	14	2-4	2	6	2-5	3
11	3-6	6		Mesothorax		7	8-12	10
12	4-9	4	1	3-6	5	8	8-19	11
13	3-5	4	2	2-6	3	9	3-4	3
14	1-2	1	3	1-3	1	10	1	1
15	4-8	4	4	5-10	7	11	2	2
18	1	1	5	1-2	1	12	1	1
6MP	1	1	6	4-9	7	13	6-12	10
	Prothorax		7	1	1		Abdomen I	
0	6-12	7	8	6-10	8	1	1-3	1
1	1	1	9	7-12	9	2	1	1

TABLE 21 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Abdomen I (Cont.)			Abdomen II (Cont.)			Abdomen IV (Cont.)	
3	6-9	7	12	4-6	4	2	1	1
4	14-21	15	13	8-14	8	3	5-7	5
5	3-5	3	14	1	1	4	2-4	2
6	3-4	3		Abdomen III		5	2-3	3
7	2-3	2	0	1	1	6	1-2	1
9	3-5	4	1	5-10	5	7	7-13	10
10	3-4	4	2	1	1	8	1-2	1
11	2-3	3	3	4-8	5	9	1	1
13	1	1	4	3-5	3	10	3-6	4
	Abdomen II		5	2-4	2	11	2-4	3
0	1	1	6	1-2	1	12	2-3	3
1	1-3	2	7	7-15	9	13	4-8	6
2	1	1	8	1	1	14	1	1
3	5-9	6	9	1	1		Abdomen V	
4	6-15	8	10	3-6	5	0	1	1
5	2-4	4	11	2-5	4	1	5-6	6
6	2-4	3	12	2-6	4	2	1	1
7	4-10	6	13	3-7	5	3	5-7	5
8	2	2	14	1	1	4	7-11	8
9	1-2	1		Abdomen IV		5	2-4	2
10	2-6	3	0	1	1	6	1	1
11	2-5	3	1	5-7	5	7	6-15	10

TABLE 21 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)		
8	1-2	1	11	2-4	3	14	1	1
9	1	1	12	3-6	4	Abdomen VIII		
10	2-6	3	13	21-28	25	0	1	1
11	2-4	3	14	1	1	1	2-5	3
12	2-4	3	Abdomen VII			2	2-3	2
13	4-7	5	0	1	1	3	6-10	7
14	1	1	1	3-7	7	4	1	1
Abdomen VI			2	1	1	5	7-12	9
0	1	1	3	5-12	9	14	1	1
1	5-8	5	4	2-7	7	Abdomen X		
2	1	1	5	2-5	3	1	1	1
3	5-8	5	6	5-14	7	2	9-11	9
4	4-7	6	7	3-4	3	3	1	1
5	2-3	3	8	2-7	2	Siphon		
6	1	1	9	2-4	3	1	3-5	4
7	4-6	4	10	2-5	3	2	1	1
8	3-7	4	11	2-4	3	6	1-2	1
9	1	1	12	4-7	5	7	1	1
10	1-3	2	13	7-14	7	8	3-5	4
						9	1	1

TABLE 22. Record of the branching of the setae on the larvae of *Aedes (Verrallina) latipennis* (6 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Antenna			Prothorax (Cont.)			Mesothorax (Cont.)	
1	3-5	4	2	3-5	3	10	1	1
	Head		3	2-4	3	11	3	3
0	1	1	4	4-7	5	12	1	1
1	1	1	5	1	1	13	12-20	14
3	1	1	6	1	1	14	7-13	-
4	4-8	5	7	2	2		Metathorax	
5	3	3	8	1-2	1	1	3-5	3
6	1-3	2	9	2-4	3	2	6-9	6
7	7-11	8	10	1	1	3	8-17	13
8	3-4	4	11	4-7	4	4	4-8	6
9	4-6	5	12	1	1	5	1	1
10	4-6	5	14	2	2	6	3-5	4
11	5-8	5		Mesothorax		7	5-7	7
12	4-8	5	1	4-7	6	8	11-18	14
13	3-5	4	2	4-6	6	9	2-3	2
14	1-2	1	3	1-4	3	10	1	1
15	4-8	7	4	5-11	9	11	1-4	2
18	1	1	5	1	1	12	1	1
6MP	1	1	6	4-6	5	13	11-17	11
	Prothorax		7	1	1		Abdomen I	
0	10-16	16	8	5-8	6	1	1-3	1
1	2-3	2	9	5-8	6	2	1	1

TABLE 22 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen I (Cont.)			Abdomen II (Cont.)			Abdomen IV (Cont.)		
3	6-10	10	12	3-6	5	2	1	1
4	10-21	20	13	10-16	14	3	5-11	6
5	3-6	5	14	1	1	4	3-5	5
6	2	2	Abdomen III			5	2-4	2
7	1	1	0	1	1	6	1	1
9	2-5	2	1	6-12	7	7	5-12	11
10	4-5	4	2	1	1	8	1	1
11	2-4	3	3	3-8	6	9	1	1
13	1-2	1	4	3-5	4	10	4-6	5
Abdomen II			5	3-4	3	11	2-4	2
0	1	1	6	1	1	12	3-5	3
1	1	1	7	8-12	9	13	6-10	6
2	1	1	8	1-2	1	14	1	1
3	6-10	7	9	1	1	Abdomen V		
4	12-18	13	10	4-5	5	0	1	1
5	4-5	4	11	3-4	3	1	5-11	7
6	2	2	12	3-4	3	2	1	1
7	5-8	5	13	6-9	7	3	3-7	5
8	2-4	2	14	1	1	4	7-12	10
9	1-2	1	Abdomen IV			5	2-4	3
10	2-3	3	0	1	1	6	1	1
11	4-6	5	1	8-14	8	7	7-16	14

TABLE 22 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)	
8	1	1	11	3-4	3	14	1	1
9	1	1	12	3-6	4		Abdomen VIII	
10	2-6	4	13	29-48	38	0	1	1
11	3-4	3	14	1	1	1	3-5	4
12	2-3	2		Abdomen VII		2	2-3	3
13	5-9	8	0	1	1	3	3-6	5
14	1	1	1	5-10	8	4	2-3	2
	Abdomen VI		2	1	1	5	5-8	7
0	1	1	3	5-10	7	14	1	1
1	6-8	7	4	4-5	4		Abdomen X	
2	1	1	5	5-9	6	1	1	1
3	3-6	5	6	11-19	11	2	5-7	6
4	5-8	7	7	3-6	3	3	1	1
5	3-6	5	8	6-12	11		Siphon	
6	1	1	9	3-4	4	1	5-8	5
7	4-8	6	10	3-5	4	2	1	1
8	5-8	6	11	2-5	3	6	1	1
9	1-2	1	12	3-6	5	7	1	1
10	2-3	3	13	8-17	12	8	4-7	5
						9	1	1

TABLE 23. Record of the branching of the setae on the larvae of *Aedes (Verrallina) leicesteri* (4 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Antenna			Prothorax (Cont.)			Mesothorax (Cont.)	
1	4-5	5	2	2-4	3	10	1	1
	Head		3	2-4	3	11	1-2	1
0	1	1	4	3-6	5	12	1	1
1	1	1	5	1	1	13	22-28	26
3	1	1	6	1	1	14	11-16	16
4	5-7	5	7	2	2		Metathorax	
5	3	3	8	1	1	1	2-4	4
6	-	-	9	2-5	2	2	8-9	8
7	8-12	-	10	1	1	3	14-20	14
8	2-4	3	11	4-6	5	4	4-6	4
9	5-7	5	12	1	1	5	1	1
10	3	3	14	1-3	2	6	3-4	4
11	6-7	7		Mesothorax		7	5-8	7
12	3-7	6	1	5-7	5	8	12-21	21
13	3-5	5	2	3-6	4	9	3-4	3
14	1-2	1	3	1-2	2	10	1	1
15	4-6	5	4	7-10	9	11	1-2	1
18	1	1	5	1	1	12	1	1
6MP	1	1	6	6-8	7	13	9-14	14
	Prothorax		7	1	1		Abdomen I	
0	9-16	15	8	6-9	8	1	1	1
1	2-3	2	9	8-12	10	2	1	1

TABLE 23 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen I (Cont.)			Abdomen II (Cont.)			Abdomen IV (Cont.)		
3	7-11	7	12	3-5	5	2	1	1
4	10-19	15	13	15-17	15	3	4-9	6
5	4-6	5	14	1	1	4	2-4	4
6	2	2	Abdomen III			5	2-4	3
7	1	1	0	1	1	6	1	1
9	4-6	4	1	5-11	8	7	6-15	7
10	5-8	8	2	1	1	8	1-2	1
11	1-2	2	3	5-8	8	9	1	1
13	1	1	4	3-5	4	10	3-5	5
Abdomen II			5	3-6	4	11	1-3	3
0	1	1	6	1	1	12	2-4	2
1	1-2	1	7	6-10	10	13	8-11	-
2	1	1	8	1	1	14	1	1
3	9-16	-	9	1	1	Abdomen V		
4	6-7	7	10	3-6	5	0	1	1
5	4-5	4	11	3-4	3	1	6-11	9
6	2	2	12	3-5	4	2	1	1
7	5-8	5	13	4-10	4	3	4-8	5
8	2-3	3	14	1	1	4	8-10	10
9	1-2	1	Abdomen IV			5	1-4	4
10	2-3	2	0	1	1	6	1-2	1
11	3-5	5	1	5-12	6	7	9-14	10

TABLE 23 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)		
8	1-2	1	11	3-5	3	14	1	1
9	1	1	12	2-4	4	Abdomen VIII		
10	2	2	13	30-41	-	0	1	1
11	2-4	3	14	1	1	1	5-7	6
12	2	2	Abdomen VII			2	2-3	3
13	11	11	0	1	1	3	8-10	10
14	1	1	1	5-10	9	4	2-3	2
Abdomen VI			2	1	1	5	7-13	11
0	1	1	3	7-12	7	14	1	1
1	5-7	5	4	3-7	6	Abdomen X		
2	1	1	5	4-8	8	1	1	1
3	5-9	8	6	9-13	-	2	6-8	7
4	6-8	6	7	3-4	3	3	1	1
5	2-5	-	8	7-10	7	Siphon		
6	1	1	9	3-4	4	1	5-10	7
7	6-13	6	10	4-5	4	2	1	1
8	5-6	5	11	2-3	3	6	1	1
9	1-2	1	12	5-8	5	7	1	1
10	2	2	13	12-13	-	8	5-6	6
						9	1	1

TABLE 24. Record of the branching of the setae on the larvae of *Aedes (Verrallina) torosus* (2 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Antenna			Prothorax (Cont.)			Mesothorax (Cont.)	
1	3-4	4	2	3	3	10	1	1
	Head		3	3	3	11	1	1
0	1	1	4	4-5	4	12	1	1
1	1	1	5	1	1	13	12-16	-
3	1	1	6	1	1	14	10	10
4	5-6	6	7	1-2	1		Metathorax	
5	2-3	2	8	1-2	1	1	3	3
6	1	1	9	3	3	2	6-10	8
7	7-8	8	10	1	1	3	8-13	-
8	3	3	11	4	4	4	4-5	4
9	5	5	12	1	1	5	1	1
10	4-5	-	14	2-3	3	6	3-5	5
11	5	5		Mesothorax		7	7-8	7
12	5-6	6	1	6	6	8	13-16	-
13	3-5	4	2	4-5	4	9	3	3
14	1	1	3	2	2	10	1	1
15	5-8	-	4	6-8	7	11	3-4	-
18	1	1	5	1	1	12	1-2	1
6MP	1	1	6	5-6	6	13	10-12	-
	Prothorax		7	1	1		Abdomen I	
0	13	13	8	6-10	7	1	1	1
1	2	2	9	7-8	8	2	1	1

TABLE 24 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen I (Cont.)			Abdomen II (Cont.)			Abdomen IV (Cont.)		
3	4-7	6	12	4-6	4	2	1	1
4	13	13	13	7-15	-	3	7-9	7
5	4-6	4	14	1	1	4	3-5	4
6	2	2	Abdomen III			5	3-4	3
7	1	1	0	1	1	6	1	1
9	4-6	4	1	9-10	9	7	9-12	-
10	4-5	4	2	1	1	8	1	1
11	3-4	3	3	5-7	7	9	1	1
13	1-2	2	4	3-4	4	10	4-6	6
Abdomen II			5	2-3	3	11	2-4	4
0	1	1	6	1	1	12	3-4	3
1	1	1	7	9-13	-	13	4	4
2	1	1	8	1	1	14	1	1
3	4-6	6	9	1	1	Abdomen V		
4	8	8	10	3-5	-	0	1	1
5	3-4	-	11	3-4	3	1	6-11	-
6	2	2	12	3-4	4	2	1	1
7	6-8	6	13	6-9	6	3	4-5	5
8	2-3	2	14	1	1	4	6-11	-
9	1-2	1	Abdomen IV			5	2-3	3
10	2-3	2	0	1	1	6	1	1
11	3-4	3	1	-	-	7	10-11	11

TABLE 24 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)		
8	1	1	11	4	4	14	1	1
9	1	1	12	3	3	Abdomen VIII		
10	2	2	13	33-38	-	0	1	1
11	3-4	3	14	1	1	1	4	4
12	2-3	3	Abdomen VII			2	2-3	3
13	6-8	-	0	1	1	3	7-9	7
14	1	1	1	6-9	-	4	2	2
Abdomen VI			2	1	1	5	7-9	9
0	1	1	3	8	8	14	1	1
1	6-10	6	4	4-5	4	Abdomen X		
2	1	1	5	5-7	7	1	1	1
3	4-5	4	6	12-13	12	2	6-9	6
4	6-7	7	7	3-4	-	3	1	1
5	3-4	4	8	6-8	8	Siphon		
6	1	1	9	2-3	3	1	4-6	5
7	6-7	6	10	3-4	4	2	1	1
8	6-7	6	11	2-3	3	6	1	1
9	1	1	12	5-6	5	7	1	1
10	2-3	3	13	8-10	8	8	3-6	4
						9	1	1

TABLE 25. Record of the branching of the setae on the larvae of *Aedes (Verrallina) uncus* (10 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Antenna			Prothorax (Cont.)			Mesothorax (Cont.)	
1	3-6	4	2	2-4	3	10	1	1
	Head		3	3-5	4	11	2	2
0	1	1	4	3-6	5	12	1	1
1	1	1	5	1	1	13	14-30	18
3	1	1	6	1	1	14	8-10	10
4	5-7	5	7	2	2		Metathorax	
5	1-3	2	8	1	1	1	3-6	4
6	1	1	9	2-4	2	2	7-10	7
7	5-10	9	10	1	1	3	6-19	14
8	3-5	4	11	3-6	5	4	6-8	6
9	4-6	5	12	1	1	5	1	1
10	4	4	14	2-3	2	6	3-6	4
11	3-4	4		Mesothorax		7	6-8	8
12	7-10	7	1	5-7	6	8	11-22	11
13	3-6	3	2	4-7	4	9	3-4	3
14	1	1	3	1-3	2	10	1	1
15	4-7	5	4	7-13	10	11	2	2
18	1	1	5	1	1	12	1	1
6MP	1	1	6	5-9	6	13	8-17	15
	Prothorax		7	1	1		Abdomen I	
0	8-17	15	8	6-8	8	1	1	1
1	1-3	2	9	6-10	10	2	1	1

TABLE 25 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen I (Cont.)			Abdomen II (Cont.)			Abdomen IV (Cont.)		
3	6-12	11	12	3-6	5	2	1	1
4	11-26	23	13	12-20	19	3	7-12	9
5	4-9	5	14	1	1	4	3-5	4
6	2	2	Abdomen III			5	2-4	3
7	1	1	0	1	1	6	1	1
9	4-5	5	1	8-13	10	7	8-14	11
10	3-5	4	2	1	1	8	1	1
11	3-4	3	3	6-12	7	9	1	1
13	1	1	4	3-6	4	10	4-6	4
Abdomen II			5	2-4	4	11	2-5	3
0	1	1	6	1	1	12	2-4	3
1	1-2	1	7	8-13	10	13	5-10	7
2	1	1	8	1	1	14	1	1
3	6-10	8	9	1-2	1	Abdomen V		
4	10-14	13	10	3-6	5	0	1	1
5	2-5	3	11	3-6	3	1	7-11	10
6	2	2	12	2-4	3	2	1	1
7	5-9	7	13	5-11	8	3	4-7	4
8	2-3	2	14	1	1	4	7-13	10
9	1	1	Abdomen IV			5	2-5	3
10	2-3	2	0	1	1	6	1	1
11	3-5	4	1	8-11	8	7	9-17	10

TABLE 25 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)		
8	1-2	1	11	2-5	4	14	1	1
9	1	1	12	3-5	4	Abdomen VIII		
10	1-2	2	13	30-62	46	0	1	1
11	3-5	3	14	1	1	1	3-6	5
12	1-3	2	Abdomen VII			2	2-4	3
13	7-11	8	0	1	1	3	6-11	9
14	1	1	1	6-10	7	4	1-2	2
Abdomen VI			2	1	1	5	6-10	8
0	1	1	3	7-10	9	14	1	1
1	6-11	8	4	4-7	4	Abdomen X		
2	1	1	5	7-10	7	1	1	1
3	3-8	5	6	9-18	13	2	5-8	6
4	7-11	8	7	2-5	3	3	1	1
5	3-7	5	8	5-10	8	Siphon		
6	1	1	9	3-5	3	1	4-8	6
7	5-8	6	10	2-5	2	2	1	1
8	5-7	6	11	2-4	3	6	1	1
9	1-2	1	12	3-6	4	7	1	1
10	2-4	2	13	9-18	4	8	3-7	6
						9	1	1

TABLE 26. Record of the branching of the setae on the larvae of *Aedes (Verrallina) vallistris* (2 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Antenna			Prothorax (Cont.)			Mesothorax (Cont.)	
1	3-4	3	2	2-3	2	10	1	1
	Head		3	3	3	11	1	1
0	1	1	4	3-6	-	12	1	1
1	1	1	5	1	1	13	30	30
3	1	1	6	1	1	14	10-11	-
4	9	9	7	1-2	2		Metathorax	
5	3	3	8	1	1	1	4	4
6	3	3	9	2	2	2	5	5
7	8-13	13	10	1	1	3	8	8
8	2-3	3	11	5	5	4	7-10	7
9	5	5	12	1	1	5	1	1
10	3-5	5	14	2-3	2	6	3-4	3
11	3-4	-		Mesothorax		7	7-8	-
12	7	7	1	5	5	8	18-22	18
13	3-4	-	2	5-6	-	9	3	3
14	1	1	3	1	1	10	1	1
15	5-6	-	4	3-4	-	11	3	3
18	1	1	5	1	1	12	1	1
6MP	1	1	6	5-6	6	13	-	-
	Prothorax		7	1	1		Abdomen I	
0	16	16	8	4-7	-	1	2	2
1	1	1	9	7-8	-	2	1	1

TABLE 26 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Abdomen I (Cont.)			Abdomen II (Cont.)			Abdomen IV (Cont.)	
3	7-13	-	12	4-6	4	2	1	1
4	7	7	13	21	21	3	5-6	-
5	5-7	-	14	1	1	4	4	4
6	2	2		Abdomen III		5	2-3	-
7	1-2	1	0	1	1	6	1	1
9	3-5	-	1	7-11	-	7	7-12	-
10	3	3	2	1	1	8	1	1
11	5	5	3	5	5	9	1	1
13	2	2	4	3	3	10	4	4
	Abdomen II		5	3-4	-	11	2-4	-
0	1	1	6	1	1	12	3-4	-
1	2	2	7	13-17	-	13	6-8	-
2	1	1	8	1	1	14	1	1
3	10-12	-	9	1	1		Abdomen V	
4	9-13	-	10	3-4	-	0	1	1
5	5	5	11	3-4	-	1	6-8	-
6	2	2	12	3-4	-	2	1	1
7	6-8	6	13	7-8	-	3	5-6	-
8	2	2	14	1	1	4	6-11	-
9	1	1		Abdomen IV		5	3	3
10	2	2	0	1	1	6	1	1
11	3-4	-	1	9	-	7	10-11	-

TABLE 26 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)		
8	1	1	11	3	3	14	1	1
9	1	1	12	3-4	-	Abdomen VIII		
10	2	2	13	27-31	-	0	1	1
11	2	2	14	1	1	1	6-8	7
12	2	2	Abdomen VII			2	3	3
13	7-9	-	0	1	1	3	6-8	6
14	1	1	1	7-11	-	4	2	2
Abdomen VI			2	1	1	5	8-13	8
0	1	1	3	12	12	14	1	1
1	8-9	-	4	4-5	5	Abdomen X		
2	1	1	5	6-7	-	1	2	2
3	5	5	6	13-14	-	2	7-9	7
4	8	8	7	4-6	-	3	1	1
5	3	3	8	6	6	Siphon		
6	1	1	9	2-3	-	1	2-3	3
7	6-7	-	10	3-5	-	2	1	1
8	6	6	11	2-3	2	6	1	1
9	1	1	12	5	5	7	1	1
10	2	2	13	14-16	-	8	-	-
						9	1	1

TABLE 27. Record of the branching of the setae on the larvae of *Aedes (Verrallina) yusafi* (3 specimens)

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Antenna			Prothorax (Cont.)			Mesothorax (Cont.)	
1	1	1	2	1-2	2	10	1	1
	Head		3	1-2	2	11	1	1
0	1	1	4	1-2	2	12	1	1
1	1	1	5	1	1	13	8-12	8
3	1	1	6	1	1	14	4-8	-
4	3-4	3	7	2-3	2		Metathorax	
5	1-2	1	8	1	1	1	2-3	2
6	2-3	2	9	2-3	2	2	4-6	4
7	2-4	3	10	1	1	3	4-7	4
8	3-4	3	11	3-5	4	4	2-4	2
9	4-5	4	12	1	1	5	1	1
10	4-5	4	14	2-3	3	6	1	1
11	2-5	4		Mesothorax		7	5-8	7
12	1-4	3	1	2-3	3	8	7-9	8
13	1-3	2	2	2-3	3	9	2-4	3
14	1	1	3	1-2	2	10	1	1
15	4-5	4	4	4	4	11	3	3
18	1	1	5	1-2	1	12	1	1
6MP	1	1	6	5-6	6	13	9	9
	Prothorax		7	1	1		Abdomen I	
0	5-7	6	8	6-8	6	1	1	1
1	1	1	9	6-9	9	2	1	1

TABLE 27 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Abdomen V (Cont.)			Abdomen VI (Cont.)			Abdomen VII (Cont.)	
8	1-2	1	11	2-3	2	14	1	1
9	1	1	12	1-2	-		Abdomen VIII	
10	1	1	13	9-16	9	0	1	1
11	2-3	2	14	1	1	1	2-3	3
12	1-2	1		Abdomen VII		2	2	2
13	4-5	4	0	1	1	3	4-8	7
14	1	1	1	2-3	3	4	1	1
	Abdomen VI		2	1	1	5	5-6	5
0	1	1	3	2-3	2	14	1	1
1	2-4	2	4	2	2		Abdomen X	
2	1	1	5	2-4	2	1	1	1
3	2	2	6	5-6	6	2	3-4	4
4	2-4	3	7	1-2	2	3	1	1
5	2	2	8	4-6	6		Siphon	
6	1-2	1	9	2	2	1	2-4	2
7	2-3	2	10	1	1	2	1	1
8	2-5	3	11	1-2	2	6	1	1
9	1	1	12	1-2	1	7	1	1
10	1	1	13	4-6	6	8	2	2
						9	1	1

TABLE 27 (Continued).

Seta	Range	Mode	Seta	Range	Mode	Seta	Range	Mode
	Abdomen I (Cont.)			Abdomen II (Cont.)			Abdomen IV (Cont.)	
3	4-5	5	12	1-3	2	2	1	1
4	6-11	-	13	4-6	4	3	3-4	3
5	3	3	14	1	1	4	2-4	3
6	1-2	2		Abdomen III		5	1-2	2
7	1	1	0	1	1	6	1	1
9	3-5	3	1	2-4	4	7	2-5	2
10	2-3	2	2	1	1	8	1	1
11	2	2	3	2-3	3	9	1	1
13	1-2	1	4	2-3	3	10	1-2	1
	Abdomen II		5	2	2	11	2-3	2
0	1	1	6	1	1	12	2	2
1	1-2	2	7	5-7	6	13	3-5	4
2	1	1	8	1	1	14	1	1
3	3	3	9	1	1		Abdomen V	
4	4-5	5	10	1-2	1	0	1	1
5	2-3	2	11	2-4	2	1	3-4	-
6	1	1	12	2-3	2	2	1	1
7	5-6	5	13	4-5	4	3	2	2
8	2-3	2	14	1	1	4	4-5	5
9	1	1		Abdomen IV		5	1-2	-
10	1	1	0	1	1	6	1	1
11	2-3	3	1	3-4	4	7	4-6	4

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